The Welſpring

of Sciences,

which teacheth the perfecte worke and practiſe of
Arithmeticke both in vvhole
numbers & Fractions, with
ſuch eaſie and compendious in-
ſtruction into the ſaide
art, as hath not here-
tofore been by any
ſet out nor la-
boured.

Beautified vvith moſt neceſſary Rules
and Queſtions, not onely profitable
for Marchauntes, but alſo for all
Artificers, as in the Ta-
ble doth plainely
appere.

Novv nevvely printed and corrected.

Sette forth by Humfrey Baker
Citizen of London.

IMPRINTED AT LON-
don by Henry Denham, for
Iames Rowbothum.

¶ *Anno Domini.* 1564.

TO THE Right Worſhipfull Maiſter Iohn Fitzvvilliams Gouernour

of the moſt famous ſocietie of Marchaunts Aduenturers into Flaunders. And to the right worſhipfull the Conſuls, Aſſiſtents, and communaltie of the ſame ſocietie, Humfrey Baker wiſheth health with continuall increaſe of commoditie by their worthy trauell.

ALTHOVGH *heretofore (right worſhipfull) diuers and ſundrye well ſkilled men in the feate, and ſcience of numbring, haue not ſpared their labour, not onely in beautifying, but alſo in augmenting the ſame with ſuch increaſe of witte, as hath exceedingly contented the ſtudentes therein, and made them riper in the exacte knowledge and redineſſe of it: Yet bicauſe an arte can not haue to much* *ſetting forthe, neither can be to much commended, I (among, and after ſo many pregnant wittes) am bolde to put forth the fruit of my blunt vnderſtanding and trauaile, in the like ſcience, not correcting or reprouing anye mans former edition, but making an attempt of my groſſe, and meane ſtudy herein, to the intent that this my enterpriſe may (by other men's doings) be either gently amended, or frendely receiued. And bicauſe I deſire ſpecially that it may be gratefullye accepted, I haue choſen you (worſhipfull) to be as defendours of this little lucubration, to whom I knowe it ſhall be welcome, not ſo much for my ſake, as for the ſcien[illegible]ue it ſelfe, wherein it is well knowen you haue ripe iudgement, and good vnderſtanding, as by your daily exerciſes it may appere. And although ſome fooliſhe heades of fanſie ouerthwart, think this arithmeticall arte peculier onely to a fewe vſing the trade of marchaundiſe, as though it were not ſo neceſſarye for other men: Yet I am ſure, the wiſeſt and beſt learned perceiuing the wonderfull arte, the deepe diuiſes, and the cunning cõ-*

cluſions that are compriſed in it: affyrme it (and that of right) to be the beſt whetſtone, or ſharpening of the witte of euery man, that euer was inuented, and thinke it moſt neceſſarye to be taught vnto children, without the which, nothing either priuate or common can be well ordered. And trewe it is, that whoſoeuer is ignoraunt of thys ſcience of numbring, he ſlepeth in all the reſt, and lacketh that promptitude of witte, which other haue in caſting and accompting of great ſummes. Yea, I ſaye hee that hath the exacte knowledge of it, hath a ſpeciall gift of GOD, and carieth about him a note and token of a good wit: and I doubt whether euer anye was counted or eſtemed ſimple or fooliſhe, that had this ſcience in hys heade.

Nowe if ſome curious braine woulde aske mee thys queſtion: Syr you commende much your Arte of numbring, can you tell who was the firſt inuentor of it, or what this worde ARITHMETICA doth ſignifie, I would aunſwere him that it is vncertaine who inuented it firſte, but well I knowe, *it is one of the ſeuen liberall ſciences: which if I ſaye God gaue vnto man to adourne his life with all, I ſay as it is, and as we ought to beleue, of whom we acknowledge to haue receiued them and not of the Poetes or heathen Goddes, as ſome ſcholemen will ſaye. Moreouer, I know that Abraham taught it firſt vnto the Egiptians, and no man will denie but that he receiued al his knowledge of God, for he worſhipped no ſtraunge Gods neither receiued anye giftes or ſciences of them. And although many yeres after, Pythagoras declared it to the Greekes, yet was not he the firſt inuentour of it, but god. Plato alſo commended it as moſt neceſſary, willing it to be taught to all youth before al other thinges. And thankes be to God, it appeareth that his precept hath been verye well followed here in Englande, for I finde not in anye nation (I ſpeake not flattering my countreymen but commending them) more ready knowledge in this ſcience, than there is in the moſte part of our youth here in Englande, and namely in London, which I ſeing it is in them, it is (out of queſtion) in their maiſters & tutours, which by their great care ouer them, haue trained them* *vp vnto the practiſe thereof, to whom the greateſt part of the praiſe redoundeth. And now right worſhipfull, when I conſider how little profit my ſimple trauaile ſhall bring, being but as it were an aſſay of further attempt, I am compelled to craue at your handes onely to accept my good will with the worke: for will and abilitie are ſomewhat vnequall in mee, but if abilitie were correſpondent to will, I woulde gladlye pleaſure you in greater things thā this is, which is but only a ſhadowe in compariſon of other mens ſubſtanciall labour & trauail in this art: yet I truſt it is not altogither ſo vnpoliſhed, but it hath paſſed vnder the file of ſome workmanſhip, wherby ſome men may take occaſiō of profit & furtherāce herein, which is my chief deſire, although I knowe many are able to doe better: for Englande is not ſo deſtitute of learned heades, but my doings may ſone be followed, yea rather amended. But yet foraſmuch as I would they ſhould knowe, that knowe not, I thought it not good to hide that which hath been opened vnto mee. And ſo caſting with my ſelfe the ſumme of all, I deſire you eftſones, right worſhipful (to whom I thought it moſt mete*

to

to preſent the fruite of my ſtudie) thankefullye to receaue it, as your wonted wiſedomes doth all things well and vertuouſely purpoſed.

Thus fare you well, deſiring God to maintaine you in your eſtate, to proſper and further all your good purpoſes, all your trafficks and voyages, encreaſe you in vertue, and keepe you in good health.

AMEN.

The diffinition of number.

NVMBER IS AS much to ſaye, as a multitude cõpounde of many vnities, as two is compounde of two vnities, thꝛee is compounde of thꝛee vnities, foure of foure vnities, fiue of fiue vnities ten of ten, fourtene of fourtene, fiftene of fiftene, twentie of twentie vnities, ⁊c.

And therefoꝛe an vnitie is no number, but the beginning and oꝛiginall of number, as if you do multiplie oꝛ deuide an vnitie by it ſelfe, it is reſolued into it ſelfe withoute any increaſe. But it is in number otherwiſe, foꝛ there can be no number, howe great ſoeuer it bee, but that it may continuallye be encreaſed by adding euermoꝛe one vnitie vnto the ſame.

¶Numeration. The firſt Chapter.

Numeration is the arte whereby to expreſſe and declare the value of any ſumme propoſed, and is of two kyndes, the one gathereth the value of a ſumme propoſed, and the other expreſſeth any ſumme cõceaued by due figures & places, for the value is one thing, & the figures are another thing: & that commeth partlye by the diuerſitie of figures, but chiefly of yͤ places wherin they be orderly ſet. And firſt marke, that there are but ten figures or characters which are vſed in Arithmetick, wherof nine of thẽ are called ſignifying figures, & the tenth is called a Ciphar, which is made like an o, & of it ſelf ſignifieth nothing, but it being ioined wͭ any of yͤ other figures, encreſeth their valu, & theſe be thei.

+ or number

1 2 3 4 5
one, two, three, foure, fiue,
6 7 8 9.
ſixe, ſeuen, eyght, nine.

Alſo you ſhall vnderſtande that euerye one of theſe fygures hath twoo values: One is alwaye certaine and hath hys ſignification of hys owne forme, and the other is vncertaine which hee taketh of his place.

A place.

A place is called the ſeate or rome that a figure ſtandeth in, and howe many figures ſoeuer are written in one ſumme x ſo manye places hath the whole value therof. And that is called the firſt place (which nexte is towarde the ryghte hande) of anye ſumme, and ſo reckning by order towarde the lefte hand, ſo that that place is laſt which is nexte the lefte hande. And contrarywyſe, when you expreſſe the value of the fygures in any ſumme, you muſte begynne at the lefte hande, and ſo recken toward the right hand.

x or number

Euerye of theſe nyne fygures, (which are called ſignifying fygures) hath his own ſimple value whẽ hee is founde alone, or in the firſt place of any ſumme. In the ſeconde place towarde the left hande, he betokeneth his own value ten times. As 70. is, ſeuen times ten: that is to ſaye ſeuentie. 80. is eyght tymes ten: that is to ſay eyghtie. In the third place euery figure betokeneth hys owne value a hundreth tymes. As 700. in that thirde place betokeneth a hundreth times 7. that is to ſay, ſeuen hundred: In the fourth place euerye figure betokeneth hys owne value a thouſande times. As 7000. is ſeuen thouſande, and 8000. is eight thouſande. Theſe foure firſt places muſt be had perfectly in minde, yea and that by heart, for by the knowledge of them you maye expreſſe all kinde of numbers how great ſo euer they bee.

In the fift place euery figure betokeneth his owne value ten thouſand times. As 70000. is ten times ſeauen thouſande, that is to ſaye ſeuentie thouſande: In ẏ ſixt place euery fygure ſtandeth for his owne value, a hundreth thouſand times. As 700000. is ſeuen hundreth thouſande. The ſeauenth place M. M. times, or a million: as 7000000. is ſeuen M.M. or ſeuen millions. And the eyght place ten M.M. times, or ten millions, ſo that euery place towarde the left hande, excedeth the former ten tymes. But nowe for the eaſy reading, and redye expreſſing orderly of any ſumme propoſed, you ſhall practiſe thys maner, folowing. And for example I propone this number 765432658. in the which are. ix. places. In the fyrſte place is. 8. & betokeneth but eyght, in the ſeconde place is 5. and betokeneth ten times fiue ẏ is fiftye, in the third place is 6. and betokeneth a hundreth times ſixe, that is vj. C. In the fourth place is 2. and that is two M. And 3. in the fifte place is ten M. times 3. that is xxx. M. So 4.

in the firſte place is C. thouſande times 4. foure, that is foure.C.M. then.5. in the ſeuenth place is a M. M.times 5. yͭ is fiue M.M.or rather fiue millions. And 6. in the eyght place is ſix times ten millions, yͭ is lx.millions.And laſt of al.vij.in the ix.place,is vij.C.millions.Now foloweth yͤ practiſe.Firſt put a pricke ouer the fourth figure, and ſo ouer the ſeuenth, and likewiſe ouer the tenth.And alſo ouer the 13.16.or.19. if you had ſo many, and ſo ſtill leauing two figures betweene euerye two pricks and theſe roomes from one prick to an other are called ternaries, then you muſte pronounce euery three figures from one pricke to an other as though they were written alone from the reſt. And at thende of their value, adde ſo many times a thouſand, as your number hath pricks (that is to ſay, if there be but 1.prick, it is but 1.M.if 2.pricks a M.M. or elſe a million, if 3. prickes

Ternaries.

M.M.M.or a M.million, & ſo conſequētli of al other figures folowing) Then come likewiſe to the next iij. fygures, and ſound them as if they were a part from the reſt, and adde to their value ſo many times thouſandes as there are pricks betwene them & the firſt place of your whole number. And ſo doe by the next iij. figures folowing & of all yͤ reſt likewiſe as in example. 451234678567. The firſt prick ouer 8. in the fourth place, which is the place of a M. the ſeconde pricke is ouer 4. in the ſeuenth place, which is the place of a M.M. or one million, yͤ thirde prick is ouer the tenth place which is the place of a M.M.M. or of a M.million, as in the former example. Then for the expreſſing of thys number by the value of euery figure accordinge to the place wherein they ſtande, you ſhall fyrſte begynne at the laſt prick ouer 1. and take it and the other two fygures 5. and 4.

which doe folowe hym, and value them alone and they are foure Clj. MMM. or elſe CCCCli. M. millions. Then take the other three figures from 1. to the next pricke, and value them as if they were a parte from the other, and they are. 234. which are CCxxxiiij. millions, or 234. MM. Then come to the thirde prick ouer. 8. and take the other two figures behinde it, and recken them likewiſe as if they were alone, and they are ſixe Clxxviij. M. And laſte of all come to the other thre figures which remayne, that is. 567. and they are fiue Clxvij. Thus yͤ whole ſum of theſe figures, is four Clj. M. two Cxxxiiij. millions, ſix Clxxviij. M. fiue Clxvij, as before.

Three kindes of Nũber.

Note alſo that whole number is deuided into thre kindes, that is to ſay, diget number, article and mixt or compounde number. The diget number, is all maner of numbers vnder ten, which are theſe nine figures,

Diget.

Article.

Mixt or cōpounde.

gures,123456789. of the which I haue ſpoken before. The Article number is any kinde which beginneth with a Cipher as this 0. and they may euer be deuided iuſt by 10. without anye remaine,as theſe, 10. 20.30.40.50.100.& all other ſuch like. The mixte or compounde number, conteineth diuers and many articles, or at the leaſt one article, and a diget, as.11.12.16.19.22.38.108.1007. and ſo forth. And as any article nūber may be made a compounde, by putting therto a diget,euen ſo likewyſe euery cōpounde number, may be made an Article number by adding therunto a 0.

⁂

¶ And here foloweth a briefe rehersall of the order and Denominatours of the places. And this ſhalbe ſufficient for Numeration.

The order of the places.		*The Denominatours of the places.*
Fyrſt.	5	Unities.
Seconde.	4	Tenthes.
Thyrde.	3	Hundrethes.
Fourth.	8	Thouſandes.
Fyfthe.	1	X. Thouſandes.
Sixte.	0	C. of Thouſandes.
Seuenth.	1	Millions.
Eyght.	2	X. of Millions.
Ninth.	3	C. of Millions.
Tenth.	4	M. of Millions.

Addition in whole number.
Chap.2.

Addition is as muche as to bring togither two ſummes or Numbers or more into one, as if there were due to any man 223.li. by ſome one bodye, and 334.li. by another, & 431. by another, & you would know howe many poundes is due to the ſame mā in all, theſe three ſummes ſhall you ſet downe orderly the one vnder the other writing ẏ greateſt ſumme higheſt and the next to the greateſt vnder it, and the leaſt ſum vnder the laſt, in ſuch ſort ẏ the firſt figure of the one ſumme be directly vnder the firſt fygure of the other, & the ſeconde vnder the ſecond, and ſo forth in order. When you haue thus done, draw vnder them a ſtraight line, & then wil they ſtand thus.

$$\begin{array}{r}4\;3\;1\\3\;3\;4\\\underline{2\;2\;3}\end{array}$$

Nowe beginne alwayes at the firſte places towarde your right hande, and put togither the three firſt fygures of theſe thre ſummes, and looke what commeth of them, write that vnder them beneath the line, as in ſaying 3.4. and 1. being put togither doe make 8. wryte 8. vnder three as thus.

$$\begin{array}{ccc} 4 & 3 & 1 \\ 3 & 3 & 4 \\ 2 & 2 & 3 \\ \hline & & 8 \end{array}$$

And then go to the ſeconde fygures and do likewyſe: as in ſaying. 2.3. & 3. maketh 8. write 8. vnder 2. as here you ſee.

$$\begin{array}{ccc} 4 & 3 & 1 \\ 3 & 3 & 4 \\ 2 & 2 & 3 \\ \hline & 8 & 8 \end{array}$$

And likewyſe doe wyth the fygures that be in the thirde place, in ſaying 2.3. and 4. are 9. put nine vnder them, & ſo wyll your whole ſume appere thus: whereby you maye perceaue that thoſe three ſummes being added togither doe make 988.li. And this is the art of addition according to his ſimplicitie, if the ſum of any place do not exceede a diget number. But in caſe ẏ ſum of ani one place cannot be ex-

$$\begin{array}{ccc} 4 & 3 & 1 \\ 3 & 3 & 4 \\ 2 & 2 & 3 \\ \hline 9 & 8 & 8 \end{array}$$

preſſed by one figure, but by two, you ſhall put yͤ firſt of thoſe figures vnder the line, and keepe the other in your minde, for to adde it vnto the firſt figure of yͤ next place. And if yͤ ſame next place cannot be aualued but by two figures, you muſt in lyke maner put the firſt of thoſe figures vnder the lyne, and reſerue the ſeconde for the other place next after, and thus muſt you doe from one place to another vntil you haue come to the laſt place, where in caſe you doe finde that the ſumme be of two figures, you muſte ſet them both downe bycauſe it is the ende of that worke, as in this example.

$$\begin{array}{r} 734682456\\ 450932345\\ 13467891\\ 4672123\\ \hline 1203754815 \end{array}$$

Where the fyrſt figures are 3.1.5.6. which added togither maketh 15. & for that, that 15. is of two figures, I doe put the fyrſte figure 5. vnder the line, and keepe the ſecond figure (which is 1.) in my minde, yͤ which. I muſt adde with the next fygures of the ſeconde place, that is to ſaye wyth 2.9.4. and 5. the whych togither make 21. I write 1. vnder the line for the ſeconde fygure of that addition, that is to ſaye after 5. and I kéepe 2. to be added vnto the third place the which wyth the other fygures 1.8.3.4. doe make 18. therfore I put 8. next after 1. in the thirde place vnder the line, and keepe 1. to bee added vnto the fygures of the fourth place, which is wyth 2.7.2.2. the which with the 1. that I keepe do make 14. I ſet downe 4. for yͤ fourth fygure (vnder yͤ line) that is to ſay, after 8. and I keepe 1. to bée added vnto the figures of the fift place, the which is 7.6.3.8. with the 1. yͭ I kepe maketh 25. I put 5. in the fift place vnder the lyne next after 4. and keepe 2. in minde to be added with the fygures of the ſixt place, that is wyth 6.4.9.6. and that 2. whych I keepe, maketh 27. I write downe 7. vnder the line in the ſixt place, and I kepe two which I adde with the fygures in the ſeuenth place, and they make 13. I put downe 3. vnder the lyne in the ſeuenth place, and adde 1. vnto the fygures in yͤ eyght place and they are 10. I do put 0. vnder the line in the eyght place, and then I adde 1. vnto the ninth place, that is to ſaye with 4.7. and they make 12. the which 12. I write at length vnder the lyne bicauſe it is the ende of thys addition, and thys is to be done of all ſuch like. And for the eaſier vnderſtanding of that which wee haue ſpoken of addition, you may examine theſe two other exāples folowing, in yͤ which yͤ firſt hath theſe nūbers. 3570. 2763. 579. 28.

which beyng added togither, doe make thys number 6940, and in the ſeconde example doth reſulte thys number 51683. by adding togither of theſe numbers, 47630, 3756, 272, 25, as here vnder written.

The numbers to be added.	3570, 2763 579 28	47630 3756 272 25
The line put betweene.		
The ſumme of this addition.	6940	51683

Of

Of Subſtraction in whole number.

The.3.Chapter.

S*Vbſtraction teacheth howe* you ſhal abate one leſſer nūber from a greater, & what ther doth remain after that you ſhal haue abated the ſame, I ſpeake not of the abating of one egall number, from an other egall vnto it, for the facilitie thereof requireth no rule.

In Subſtraction are founde thrée nūbers, the one is yͭ, from yͤ which the ſubſtractiō is made. The ſecond is the number yͭ is to be ſubſtracted and the third is the number which remaineth after yͤ ſubſtractiō is ended. As when I would ſubſtract.25. frō 40. The 40.is the nūber frō the which yͤ ſubſtractiō is made. 25.is yͤ nūber to be ſubſtracted, & 15. is the nūber which remaineth after you haue done the ſubſtractiō, here foloweth yͤ practiſe. You ſhall put yͤ leſſer nūber vnder the greater in ſuch ſorte that euerye figure of the one number may aunſwere vnto euerye figure of the other orderly, and then drawe a right line vnder thoſe two numbers as you did in Addition. Then muſt you beginne at the right hande and take the firſt figure of the vndermoſt number & abate that frō the firſte figure of yͤ vppermoſt number, & that which remaineth you muſte ſet vnderneth the line right vnder yͤ figure which you haue ſubſtracted. Then afterwarde take likewiſe the ſecond figure of yͤ nethermoſt nūber, and abate that alſo from the ſeconde fygure of the higher number. The thyrde from the thirde, and ſo forth of all the reſt tyll you come to the ende, putting alwaies yͤ remaine of euery figure vnder the line in hys order, exāple. I wyll ſubſtract.2345.from 9876.after that I haue put them downe according to the maner aforeſaide.

$$\begin{array}{r} 9876 \\ \underline{2345} \\ 7531 \end{array}$$

I take firſte 5. from 6. and there reſteth 1. the which I ſet vnder the line right againſt 5. Secondly I abate 4. from 7. and there reſteth 3. the which I ſet in the ſeconde place vnder the line, next after 1. Thirdlye, I abate 3. from 8. and there reſteth 5. The which I put vnder the line in the thirde place, fynally I do abate 2. from 9. and there reſteth 7. the which I put vnder yͤ line in the fourth and laſte place, and thus is this Subſtractiō ended, by yͤ which there reſteth. 7531.

But when twoo figures of one likeneſſe doe chaunce to meete, ſo yͭ the one muſt be abated from the other, as if I ſhould abate 7. from 7. there remaineth nothing, and then muſt I ſet a cipher 0. vnder the line. But whē the fygure which is to be abated, doth exceede yͤ figure which is ouer him, ſo that it cannot be taken out of the ſame figure. Then muſte you abate the nether figure from 10. And yͤ which doth remaine you ſhall adde vnto the ſame figure which is vppermoſt. And the ſum which commeth therof ſhal you ſet vnder the line. But whenſoeuer you doe borrowe any ſuch 10. of the ouer number: you muſt adde 1. vnto the next nether figure folowing which is to be abated. And there is nothing elſe to be done in ſubſtraction. Exaumple, I wyll ſubſtract 93576. from 4037479. after that I haue placed my two numbers, as I ought to doe, I doe firſt abate. 6. frõ 9. and there reſteth 3. then I put the 3. vnder the line ryght againſt 6. And ſecondely I abate 7. from 7. And there reſteth nothing. I doe put a cipher 0. vnder the line right againſt 7. in the ſecond place. Then I come to the thyrde place where I fynde 5. which I cannot bate frõ the figure ouer him, which

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4037479.
  93576.
-------
3943903.
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is but 4. therfore I doe abate it frō 10. as before I taught and there reſteth 5. the which I doe adde wyth the 4. which is ouer him, and that maketh 9. I put 9. in the third place vnder the line for the thirde figure. Fourthly, for the 10. whych I borowed I adde one vnto the next nether fygure which is thrée, and they make 4. the which I do abate from the ouer fygure 7. and there reſteth 3. I put 3. vnder the lyne for the fourth figure. And then I come to the fift place where I doe fynde 9. which I cannot abate from the figure ouer him which is but 3. but I abate 9. from 10. and there reſteth 1. the which I doe adde wyth 3. and they make 4. I put 4. vnder the line for the fift figure. And if it wer not, for that I did laſt borow 10. the ſubſtractiō ſhould haue béen ended. But for bycauſe that I muſt (for euery ſuche ten that I borowe) alwayes adde 1. vnto the next nether fygure folowing, I muſt therefore procæde vnto the ſubſtraction. And for ỷ that there is no other fygure folowing in the nether number, it ſhal ſuffiſe to haue kept the vnitie, and to abate it from the next ouer fygure. But I finde there 0. & cannot abate 1. from 0. therfore I abate it from 10. and there reſteth 9. which I doe put vnder the line in the ſixte place, finallye for the ten which I borowed, I kæpe 1. in minde. The which I do abate from 4. and there remaineth 3. the which I do put vnder the line in ỷ ſeuenth place after 9. And ỷ operation is thus ended.

An other example.

576084026
485675437

90408589

But if there were many numbers to be ſubſtracted from one nūber alone, then muſt you fyrſt adde thoſe numbers togither according vnto the doctrine of the Chapiter going befoꝛe,and thẽ to make your ſubſtraction as aboue ſaide. As if I woulde abate theſe thꝛee ſummes 123.234.456. from. 98925. firſt I doe adde the thꝛee ſummes into one, & they are. 813. The which I do abate from 98925. and there reſteth. 98112.

Of Multiplication.

Chapter. 4.

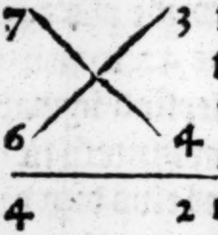
IN multiplicatiõ there are iij. numbers to be noted, yͭ is to ſay the numbꝛe which is tobe multiplied,the which wee will call the Multiplicande: and the number by the which we multiplie,wee call the multiplyer, oꝛ multiplicatour. And yͤ thirde number is that which commeth of the multiplication of the one by the other, which is called the pꝛoduct. As when I would know how much mounteth 10. multiplied by 9. yͭ is to ſay how much are ten times nine. I fynde that they are woꝛth. 90. then 10. is yͤ multiplicand,9. is the multiplier.

And 90. is called the product. Thē for to multiplie, is none other thing, but to finde a number which cōteineth the multiplicande ſo many times, as the multiplier conteineth vnities, As 10. multiplied by 9. doe make 90. as before ſaid. And 90. conteineth 10. ſo many times, as 9. conteineth vnities, that is to ſaye nine tymes.

In multiplication, it forceth not much which of the two numbers bee the multiplicande, nor which bee the multiplier. For ten multiplied by 9. maketh as many as 9. multiplied by 10. yet neuertheleſſe it ſhall be more commodious that the leſſer number be alwayes the multiplier.

And for that, that the multyplication of figures the one by the other, is ẏ moſt chief & neceſſarieſt kind wherby to know how to work in the multiplication of compound numbers, and that euery mā hath not at the fingers ende: I wil therfore giue you here certeine eaſye wayes of multiplicatiõ of diget nũbers. When you would multiplye two ſimple figures, or digets yͤ one by the other, abate eche of thoſe dyget numbers from 10. Then multiplie the two remaines the one by the other. And if the ſum do excæde 10. write only the firſt figure, & kepe the other to be added to the next operation, which is thus. Adde your two ſimple figures togither: And of yͭ which reſulteth of yͤ addition, take onely the firſt figure, vnto the which you muſt add yͤ vnity which you kæpe before. And yͭ ſhall be the ſecond figure of the ſum which you do ſæke. Exãple, I would multipli 7. by 6. I take 7. frõ 10. and there reſteth 3. likewiſe I abate 6. from 10. and there reſteth 4. then I ſay thus 3. times 4. make 12. I write 2. for my firſt figure, & I kæpe 1. in my mind, thẽ I adde 6. wͭ 7. & they are 13. of the which I caſte away the ſeconde fygure 1. and I take only the fyrſt fygure 3. vnto the which I adde ẏ vnitie which I kepte, & they make 4. which I write in the ſeconde place, after 2. And thus I finde 42. which is the valure of 7. multiplied by 6.

Otherwiſe, and all commeth to one effect, ſet down your two diget numbers the one right ouer the other, & right againſt euery of them towarde the right hande write hys owne diſtaunce from. 10: Then multiple the two differences togither, the fygure which commeth thereof, ſhall you ſet downe vnder both the differences. But if there be two fygures, ſet downe but the fyrſt, and keepe the other in your minde afterwardes abate (from one of ẏ two diget nūbers) the difference of the other diget number that is to ſay, croſſewiſe. And vnto the remaine adde the fygure which you kepte, and that ſhalbe the ſeconde number, and thus you ſhall haue your multiplication. Example of the lyke figures that is to ſay of 7. multiplied by 6. the diſtaunce of 7. vnto 10. is 3. And the diſtaunce of 6. from 10. is 4. I ſet them downe croſſwayes as you ſee: And then I ſaye three times foure are 12. I ſet downe twoo and keepe one in my minde, then I abate 4. from 7. or elſe three from 6. it forceth not from which of them: and there reſteth alwaies 3. vnto the which I adde the vnitie which I kepte in my minde, and they are foure, which ſhalbe the ſeconde fygure of the multiplication. And thus I finde that 7. multiplied by 6. maketh 42. as in the other operation. Thys practiſe hath no place where the 12. digit numbers (doe not exceede 10.) by adding them togither, and then is multiplica-



plication eaſye ynough without any rule.

Another way to knowe the multiplication of ſymple numbers, is by thys table following: the vſe wherof is thus.

Fyrſt you ſhall vnderſtande that the numbers from 1. and ſo downewardes to 9. ſet in the left parte or hanging margine of this table doe betoke the multipliers of all ſimple numbers. And the elements or fygures being put higheſt in euerye ſquare roome drawing towarde your right hand right againſt euery of the multipliers, do ſignifie the multiplicands, vnto ẏ multipliers of the hanging margin. And the lower or inferiour numbers in euery ſquare roome, do betoken ẏ product of that multiplication, whych is made in multiplying the vpper nūber ouer it, with the fygure in the hāging margin, anſwering dyrectly vnto ẏ ſaide ſquare; as by exāple,

The

Richard Wrightes Booke 1653

Richard [illegible] 1653

The Table of multiplication by all the Diget numbers.

1	1 1	2 2	3 3	4 4	5 5	6 6	7 7	8 8	9 9
2	2 4	3 6	4 8	5 10	6 12	7 14	8 16	9 18	
3	3 9	4 12	5 15	6 18	7 21	8 24	9 27		
4	4 16	5 20	6 24	7 28	8 32	9 36			
5	5 25	6 30	7 35	8 40	9 45				
6	6 36	7 42	8 48	9 54					
7	7 49	8 56	9 63						
8	8 64	9 72							
9	9 81								

This is [illegible] Bill[illegible] 1608

booke yf he it loss and you it find

he praye you for to restore it to him

a gayne and he will geue you for your

paines [illegible] that [illegible]

Firſt bicauſe 1. doth not multiplye, I ſet in the vpper margin the figures frõ 1.to 9.both in the higher and alſo in the inferiour rowes,for 1. in the hanging margine, multiplied by 1. the vpper number in the firſt ſquare bringeth but 1. ſo lykewyſe 2. beyng the higher number in the ſeconde ſquare of the vpper margine multiplied by 1. in the hãging margin, bringeth two for the lower number in the ſecond ſquare of the vpper margine,for one times 1. maketh but 1.and 1.times. 2. maketh 2. then 1. times 3. maketh 3. and 1.times 4.maketh 4.and ſo cõtinuing towarde the ryght hande vntill you come to the figure of 9. which is 1.times 9.maketh 9.Then after multiple two of the hanging margine by 2. the vpper number of the ſquare nexte towarde the right hande and that maketh foure which is yͤ product of 2. multiplied by 2.which 4.is ſet vnder the 2. for

2.times.2.are.4.and 2.times.3.maketh 6.then 2. times 4. maketh 8. and two times 5. maketh 10. and ſo continuing vnto 2. times 9. which maketh 18. The lyke is to be done with the thirde rowe, and ſo lykewyſe of all the reſydue.

Exaumple, I woulde knowe what is the product of 9. multiplied by 8. I ſeeke in yͤ hanging mergin the multiplier 8.and amongeſt the ſquares directlye againſt eyght drawing towarde the right hande, I ſeeke the multiplicand 9. in the higher rowe, and I fynde the product right vnder 9. to be 72. Then 72. is the number which commeth of the multiplication of 9. by 8. and ſo is to bee vnderſtande of all the reaſt of the table, which table muſt bee of all men learned by heart, or as they ſaye wythoute booke, whych being learned you ſhall the better attaine to the reſt of multiplication.

To come nowe unto the practiſe of multiplication, when you woulde multiplie two numbers the one by the other, you muſt ſet them down after the ſame maner as you did in addition, and in ſubſtraction. That is to ſaye, the fyrſt fygure of the multiplier under the fyrſt fygure of the multiplicande, the seconde under the second, and the third under the thirde, if there be ſo many, and then drawa right line under them, as in the other operations going before. After you ſhall multiply all the figures of the multiplicande by the multiplier, and ſet downe the figures (comming of any ſuch multiplicatiõ) under the line euery one in order.

Exaumple, I woulde multiply 123. by 3. that is to ſaye, I woulde knowe how much amounteth thre times one hundreth, twentie and three. The two numbers beyng placed in ſuche order as is before

ſayde,

ſaid, you muſt beginne towardes yͤ right hande: and ſay thus 3. tymes 3. are 9. write down 9. vnder the line, right againſt 3. for the firſt fygure: ſecondly by the ſame 3. you muſt multiplie yͤ ſecond figure 2. & they make 6. put downe 6. after the 9. vnder the lyne: Thirdly by yͤ ſame 3. you ſhall multiplie the laſt figure 1. and they are but three, ſet downe 3. after 6. for the thirde & laſt figure. And thus is yͤ worke ended: wherby you ſhall finde, that 123. beyng multiplyed by 3. maketh 369.

$$\begin{array}{r}1\,2\,3\\3\\\hline 3\,6\,9\end{array}$$

But when that of the multiplicatiō of one figure by an other. The ſum which commeth therof ſhalbe of twoo fygures, as it happeneth moſte often, then ſhall you write downe the firſt fygure, and keepe the other fygure to be added vnto yͤ multiplication of the next fygure.

Exaumple, Syx men haue gained (euery one of thē) 345. crownes

$$\begin{array}{r}345\\ 6\\ \hline 2070\end{array}$$

I would know how many crowns they had in all. Firſte I multiplie 6. times 5. are 30. I write 0. vnder the line, & keepe 3. to bee added to the next multiplication: Secondely I ſaye 6. times 4. are 24. vnto the which I adde 3 which I reſerued. And they make 27. I write 7. in the ſeconde place vnder yͤ line, and I keepe 2. to be added to yͤ next multiplication, thirdely I ſaye ſyxe times 3. are 18. vnto the which I adde the 2. which I keepe. And they make 20. yͤ which I write al downe for bicauſe that is yͤ laſt worke. And ſo I finde yͤ 345. being multiplied by 6. do make 2070. Whē the multiplier is of many figures you muſt multiplie all the whole multiplicand by euery one of thoſe figures, and write the productes euery one vnder hys owne fygure.

Example. I would know how many dayes are paſt from the natiuitie of Ieſus Chriſte vntyll the yeare 1560.full complete. I haue to multiplie 1560. by 365. whych are the dayes of one whole yeare. The leape yeares not being reckened,which haue euery one of them 366.dayes.

```
 1560
  365
-----
 7800
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Fyrſt by the fygure 5.I multiplie al the higher figures, ſaying thus fyue times 0.maketh 0.I writ 0. vnder the line for the firſt figure, and bicauſe I keepe nothing for the next place, I proceede & ſay 5.times 6.are 30. I ſet 0.vnder the line for yͤ ſecond figure,& I kepe 3.to be added to yͤ next multiplication, thirdlye I ſay 5.times 5. are 25. The which wͭ 3.that I keepe are 28.I ſet downe 8. and keepe 2.to be added with yͤ next multiplication. Then comming vnto the fourth and laſt fygure, I ſaye 5.times 1. are 5. the which wͭ 2. that I reſerued are 7: I put 7.for yͤ laſt figure of thys fyrſte operation by the fygure 5.with the which fygure we haue no more to doe. And therefore I cancell the ſame 5.with a little ſtrike thorow it,to ſignifie yͭ we haue finiſhed with that figure. And foraſmuch that in multiplication there is alwayes as many ſimple operations , as the multiplier conteineth figures . There reſteth yet 2. operatōis to be made.I come then vnto the ſeconde operation, which is by yͤ figure 6.by yͤ which I muſt again multiplie al the figures of the multiplicande as I did by 5 & the firſt fygure (which ſhalbe produced)you muſt put one rank more lower then yͤ figures of the operation euen now made by 5.not right vnder yͤ firſt fygure of the multiplier 5.but vnder 6. yͭ is to ſay: one place more forewarde than the fift toward the left hande: & one ranck more lower than the fyrſt operation: and you ſhall put afterwarde euerye of yͤ other figures which cōmeth of the ſame multiplication in their order : thirdly you muſt make the multiplicatiō by ẏ thirde figure & that which ſhal come thereof you muſt ſet in his ranck, as here vnder you ſe. And now we næde make no further diſcourſe hereof, bicauſe ẏ he which can doe the fyrſt multiplication by 5. may as eaſely doe all the others. It ſhall therefore ſuffice to ſet here vnder the examples.

1560	1560
365	365
7800	7800
9360	9360
	4680

Now, if you wil know how much ẏ operations thus placed do amoūt vnto, which in value are but one nūber : you muſt add thoſe thre nūbers togither, but not after ẏ ſame maner as we haue done in ẏ chapter of addition, the firſt figure of ẏ firſt ranck wᵗ the firſt figure of the ſeconde ranck, & of the thirde ; but you muſte adde them in the ſame ſort as you ſhal finde them ſituated or placed: that is to ſay, the fyrſt figure of the fyrſt rancke alone by it ſelfe: the ſecond of that ranck with the fyrſt of the ſeconde rancke. The thirde of the fyrſt rancke wyth the ſeconde figure of the ſecond rancke and the firſt of the thirde ranck: and ſo of all other as hereafter doeth appeare.

And thus the 1560 yeares do containe fiue hundreth ſixtye & nyne thouſande foure hundreth dayes not counting herein the daies of the leape yeares, which are here in number 390. for then the whole ſum of the dayes ſhould be 569790.

```
   1560
    365
 ------
   7800
  9360
 4680
 ------
 569400
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Another example.

34560
2456

207360
172800
138240
69120

84879360

The ſumme of multiplication, when you woulde multiplie anye number by 10. you muſt onely adde one cipher unto all the number. As 345. multiplied by 10. maketh 3450. if you wyll multiplie by 100. Adde unto the whole nūber two ciphers. 00. if by 1000. adde 000. And to bee briefe. when the laſte fygure of the multiplier is 1. and al the reſt bee ciphers, add ſo many ciphers to your multiplicāde, as there ſhalbe found in your multiplier. But if in multiplying, the laſt figure were not 1. but that there were onely certaine ciphers in the beginning: & that the other were ſignifying fygures, and likewiſe thoſe of the multiplicand, then ſhall you put thoſe cyphers apart, and multiplie the ſignifying figures of the one by the ſignifying fygures of yͤ other. Then adde unto the pꝛoduct of that multiplication, al the ciphers which you did befoꝛe put a part. As if I would multiplie. 46000. by 3500. I put a part yͤ thꝛee ciphers of yͤ firſt, and the two ciphers of the ſeconde nũbers. And then I multiplie 46. by 35. & therof commeth 1610: unto the whych I adde the 00000. and then the whole pꝛoduct will be. 161000000.

```
    4 6
    3 5
   ─────
  2 3 0
1 3 8
─────────────────
1 6 1 0 0 0 0 0 0
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Of Diuiſion the fift Chap.

DIuiſion or partition is, to ſeeke how many times one number doth conteine an other for in this operation are firſte required twoo numbers for the fynding out of the thirde. The firſte number is called the diuidende or number which is to be diuided & that muſte be the greater number, the other number is called the diuiſor, & that is the leſſer. And the third number which we ſeke is called the quotiēt. As if I would diuide 36. by 9. the diuidend ſhall be. 36. and the diuiſour is 9. And for bicauſe that 9. is cōteined in 36. foure times, that is to ſay yͤ 4. times 9. do make 36. The quotient ſhall be 4. as in marking how many times 9. is conteined in. 36.

¶ *The practiſe.*

Wryte downe fyrſte the deuidende in the higher number, and the diuiſour vnderneth, in ſuche ſorte, that the fyrſt fygure of the diuiſour towarde the lefte hande be vnder the fyrſt of the diuidend and euery figure of the ſame diuiſor vnder his like, that is to ſaye, the fyrſt vnder the fyrſt, the ſeconde vnder yͤ ſeconde, the thirde vnder the third, and ſo conſequentlye of the other, if there be any more, which is contrarye to the other three kindes before ſpecifyed, but you muſte conſider if all the lower figures of the diuiſor, maye be taken out of the higher fygures of the diuidend, by the order of ſubſtraction. The which if you can not doe, then muſte you ſet the fyrſt fygure of the Diuiſor (toward the lefte hande) vnder the ſeconde fygure of yͤ diuidend, and ſo conſequently the reaſt, if any be to be ſet down euery one of them vnder his like as before is ſaid. And thē draw a lyne betweene the diuidende and the diuiſor. And at the ende of them an other crooked lyne, behinde the which toward the right hand, ſhall be ſet your quotient. As by this example folowing where the diuiſor is but of one fygure.

If you woulde diuide 860. by 4. you muſt ſet downe 4. vnder the 8. with a line betwene them as here vnder you may ſee.

The diuidende	8 6 0
Diuiſor.	4

And then you muſte ſeeke howe many times the diuiſor is cōteined in yͤ higher nūber, or diuidend aunſwering to him, as in this our exāple I muſt ſeke how many times 4. is conteined in 8. in yͤ which I finde 2. times, then I write downe 2. apart behinde the crooked line, as you ſe, which ſhalbe the firſt figure of the quotient to come, ſecondly by this fygure (being thus put apart) I muſt multiple the diuiſor and vnder the ſame multiplication. I muſt ſet that number which com-

8	6	0	
4			(2
8			

commeth of the ſame multiplication as 2.times 4. doe make 8.which 8. I do ſet vnder the 4.which is the diuiſor. Thirdly, I do ſubſtract the product of the ſayde multiplication (of the quotiēt by the diuiſor) from the higher number correſpondant to the ſame,as if I abate 8. from 8. there remaineth nothing,and then I canſell or ſtrike out that whych is done as you ſee. In theſe three operations is comprehēded the arte of diuiſion . The which are to bee obſerued frō point to point for ther is no diuerſitie in the finiſhing of the ſame which is thus.

I muſt remoue my diuiſor one place nerer toward my right hand; as in proceding with our exāple I remoue my deuiſor 4. which was vnder 8.and I ſet it vnder 6. then I ſeeke how many times 4. is conteined in 6. where I fynde but one time thē I ſet 1.behinde yͤ crooked

$$\begin{array}{l} \quad 2 \\ \cancel{8}\;\cancel{6}\;\cancel{0}\ \ (21 \\ \hline \quad 4 \end{array}$$

ked line behinde 2. afterwarde by this laſt ⁊ new figure 1. I multiplie the diuiſor 4. ⁊ that maketh but 4. (for an vnity which is but 1. encreaſeth nothing) I abate 4. from the higher figure 6. and there reſteth 2. yͤ which 2. I ſet ouer the 6. ⁊ I cancell the 6. for ſo muſt you doe when there reſteth anye thing after you haue made yͤ ſubſtraction. Thirdly for yͤ there yet remaineth another fygure in the diuidend, I remoue again the diuiſor, and I ſet it vnder the cipher 0. Then I ſeeke how many times 4. is in the higher nũber which is 20. where I fynde 5. times, I put 5. behinde yͤ crooked line for the thirde and laſte figure of the quotient. Then by the ſame 5. I multiply yͤ diuiſor 4. and yͤ maketh 20. the which I abate frõ yͤ higher number, and there reſteth nothing. And ſo is this diuiſion ended: ⁊ I haue founde yͤ. 860. being deuided

$$\begin{array}{l} \quad 2 \\ 8\,\cancel{6}\,0\ (215 \\ \hline \qquad \cancel{4} \\ \quad \cancel{2}\,\cancel{0} \end{array}$$

diuided by 4. bringeth for the quotient 215. that is to ſay, that 4. is cōteyned in 860. two hundreth & fyftene tymes. Thys is the moſt eaſieſt working that is in diuiſion, but that which foloweth, apperteyneth to the whole and perfect vnderſtanding of the ſame. When the fyrſte fygure of your diuiſor toward your left hande is greater than the fyrſt of yͤ diuidende, you muſt not place the fyrſte fygure of your diuiſour right vnderneth the fyrſt of the diuidende, but vnder the ſeconde fygure of the ſame diuidende, neerer to your right hāde, as before is ſaid. Whē yͤ diuiſor is of many figures, and yͭ you haue to ſeeke how many times it is conteined in the higher number (for the more eaſyer working) you muſte not ſeeke to abate the diuiſor all at one time, but you muſte ſee and marke howe many times the fyrſt fygure of the ſame towarde the lefte hande is conteyned in the hygher number aunſwering to the ſaid number, & then to worke after the ſame maner as is before taught.

Exãple, I haue 316215. crownes to be deuided amonge 45. men for to make my diuiſion I muſte not put the fyrſte fygure of the diuiſor which is 4. vnder the firſt of the diuidende, which is 3. bicauſe that 4. is greater number than 3. And further, I cannot take 4. out of three, wherefore I muſt ſet the 4. vnder the ſeconde fygure of the hygher number which is 1. and the fygure 5. of the diuiſor next right vnder the 6. as you may ſee.

$$\begin{array}{l}\underline{3\;1\;6\;2\;1\;5\quad}\\ \;\;4\;5\end{array}$$

I muſt firſt ſeeke, how many times 45. is cõteyned in 316. which is but parte of the diuidende, wherefore for the more eaſie working I neede but to ſeeke howe many times 4. is conteined in 31. & bicauſe I may haue it ſeauẽ tymes

I put 7. behinde the crooked line, as is aforeſaide, then by 7. I multiply all the diuiſor 45. and they are 315: the which I ſet vnder yͤ ſame diuiſor, the fyrſt fygure vnder the fyrſt: And the other in order towarde the lefte hande. Then I ſubſtract. 315. from the higher number 316. and of this fyrſt working there remaineth but 1. the which I ſet ouer the 6. and I cancell the. 315. & the other fygures 3, 1, 6, and alſo the diuiſor: and then it wil ſtande thus.

$$\begin{array}{rr} 1 & \\ \cancel{3}\cancel{1}\cancel{6} & 215 \\ \hline \cancel{4}\cancel{5} & (7 \\ \cancel{3}\cancel{1}\cancel{5} & \end{array}$$

And when I come to remoue the diuiſor, and that I muſt ſeeke how many times it is conteined in the higher number, if I ſee that I cannot fynde it there, that is to ſay that if the higher number be leſſer than the diuiſor, as it is in this example, then muſt I put a cipher in yͤ quotient behinde the crooked line, & if there remain any figures in yͤ diuidende whiche are not finiſhed, I muſt remoue the diuiſor agayne nerer towarde my right hande by one place, for to finde a newe fygure in the quotient. As in this our example, for after that I haue remoued the diuiſor, I ſeeke howe many times. 45. is conteined in. 12. and becauſe I cannot haue 45. in. 12. I put a 0. behinde the croked line after 7. then without multiplying or abatyng, I remoue againe the diuiſor nerer towarde my ryght hande, and I ſeeke howe many tymes 4. (whiche is the firſt figure of the diuiſor) is in the hygher numbre, that is to ſay, in 12. whereas I finde it 3. tymes: I put 3. behinde the crooked lyne, for the thyrde fygure of the quotient: then by 3. I multiplie the diuiſor, 45. and therof commeth. 135.

$$\begin{array}{l} \quad 1 \\ \cancel{8}\cancel{2}\ \cancel{6}215 \\ \hline \quad 45(70 \end{array}$$

$$\begin{array}{l} \quad 1 \\ \cancel{3}\cancel{1}\cancel{6}215 \\ \hline \quad\ 45(703 \\ \quad 135 \end{array}$$

A note. But here is to bee noted, that if it happen that the fygure beynge laſte founde whiche is put in the quotient, doe produce or bringe foorthe a greater noumbre (in multiplyng all the dyuiſor by the ſame) then that whiche is ouer the ſaied diuiſor: you muſte then make the ſame figure of youre quotient (whiche you doe put downe) leſſer by one: and after that you haue cancelled the firſte multiplication, you muſt make a newe. And the ſame muſt bee ſo doone as often times: as (in decreaſing the ſame) it produceth a leſſer noumbre, or at the leaſt, a noumbre egall to that whiche is ouer it. As in the laſte woorke: for becauſe that the diuiſor, being multiplied by 3. bringeth foorthe. 135. whiche amounteth more then. 121. the ſame producte muſt be cancelled. And likewyſe the figure. 3. whiche I did put in the quotient, muſt bee chaunged into a figure of 2. Then by the ſaied 2. I muſt multiplie the diuiſor. 45. and thereof commeth 90, the whiche I abate from. 121. and there remaineth. 31. And then wil yͤ ſomme ſtand thus.

$$\begin{array}{ccccccr}
 & \cancel{1} & 3 & & & & \\
\cancel{3} & \cancel{1} & \cancel{6} & \cancel{2} & 1 & 5 & \\ \hline
 & & & \cancel{4} & \cancel{5} & & 2 \\
 & & \cancel{1} & \cancel{3} & \cancel{5} & & (70\cancel{3} \\
 & & & \cancel{9} & \cancel{0} & &
\end{array}$$

A note.

And here is alſo to bee noted that the ſomme whiche remaineth muſt be alwayes leſſer then the diuiſor. Thẽ finally I remoue the diuiſor to the 2. laſt figures towarde the right hande, and I ſeeke howe many times 4. is in 31. And for becauſe I finde it 7. times, I put 7. in the quotient: by the whiche I multiplie the diuiſor, and thereof commeth 315. the whiche I abate frõ the hygher noumbre of the diuidend, and there remaineth nothing as here you may ſee.

$$\begin{array}{ccccccr}
 & & \cancel{1} & \cancel{3} & & & \\
\cancel{3} & \cancel{1} & \cancel{6} & \cancel{2} & \cancel{1} & \cancel{5} & \\ \hline
 & & & & \cancel{4} & \cancel{5} & (7027 \\
 & & & \cancel{3} & \cancel{1} & \cancel{5} &
\end{array}$$

But in caſe that after the diuiſion is ended, there doe remaine any thing in the diuidende, as moſt often times there dothe: I muſt them ſette that remaine aparte behinde the croked line after the entier quotient, and the diuiſor right vnder the ſame remayne, with a lyne betwene them bothe, as in this diuiſion followyng, where there remayneth 3. in the laſt woorke of the ſame. And we ſhal ſee what the ſame doth ſignifie, whē we ſhal treate of fractions or broken numbres.

j.

11
~~4~~~~6~~~~7~~859
~~4~~~~8~~~~6~~ (1

ij.

11
~~4~~~~6~~~~7~~859 (10
~~4~~~~8~~~~6~~

iij.

2
~~2~~~~1~~73
~~4~~~~6~~~~7~~~~8~~~~5~~9
~~4~~~~8~~~~6~~
~~9~~~~1~~~~2~~ (102

iiij.

~~2~~
~~1~~~~1~~~~7~~~~3~~3
~~4~~~~6~~~~7~~~~8~~~~5~~~~9~~
~~4~~~~8~~~~6~~ (1026. $\frac{3}{456}$
~~2~~~~7~~~~3~~~~6~~

In ſumme, all the whole practiſe of diuiſion may bee kepte in remembraunce by three lettres, that is to ſay: S. M. A. whiche three letters doe ſignifie to ſeeke, to multiplie, to abate.

Firſt, I muſt ſeeke howe manye times the diuiſor is conteined in the higher numbre: then, by the quotient (whiche I finde) I muſt multiplie the diuiſor: finally, I muſt abate the product of that multiplication, from the higher numbre to the ſame correſpondent, that is to ſaye: out of the diuidende, aunſwering to the diuiſor.

And further, beſides this kynde of woorkyng in diuiſion. The whiche is reguler and commune: I wyll here put an other manner of woorkynge very eaſye. The whiche ſhall ſerue for ſoche diuiſions as are difficyll to bee wrought. That is to wytte, when the number to bee diuided is verye great, and the diuiſor greac alſo, and it ſhall ſerue againe for to auoyde errour in ſupputacion, and for the plaſing of fewer figures in the quotient: and conſequently it ſhall ſaue muche labour vnto them whiche as yet haue muche ſtudied in this arte. The practiſe whereof is thus, as foloweth.

I haue to deuide 7894658. by 643. In the firſte place, you ſhall vnderſtande, that althoughe the firſte figure of the diuiſor towarde your lefte hande, maye bee founde many times in the hygher noumbre as 10. times 12. times or more: yet is it ſo, that you muſt neuer putte but one figure onely at a tyme in your quotient. And thus you ſhall at no time putte any noumbre in your quotient which exceadeth the fygure of. 9. that is to ſaie any noumbre being greater then 9. for to come then vnto our practiſe, wryte downe your dyuiſor one time: and behynde it towarde your ryghte hande, drawe a lyne downe ſtraighte, and right againſt the ſame diuiſor behinde the lyne put this fygure 1. Thē double your ſaied diuiſor, and righte againſt the ſame (beyng doubled) put behinde the lyne the fygure of 2. After, adde vnto the ſame noumbre (whiche you doubled) your ſaied diuiſor and right againſt the ſame product, behinde the line put the fygure of. 3. And vnto this thyrde producte, you muſte adde againe your diuiſor: and ryght againſt the ſame producte behinde the lyne ſette the fygure. 4. And this muſte you dooe, vntill you come to the fygure of. 9: in ſoche ſorte that euerye of the productes dooe ſurmounte ſo muche his former noumbre, as all the diuyſor dothe amounte vnto: placing at the right ſyde of euerye producte behynde the lyne, the noumbre whiche ſignifieth howe muche he is in order. That is to ſaye, right againſt the fifte producte, you muſt put. 5. right againſt the ſixte producte, you muſte put. 6: And ſo likewyſe of all the other.

Example of the diuiſor proponed,

643. firſt, I wryte downe 643. and right againſt the ſame behind the lyne I put .1. ſecondely, I double 643. and thei make 1286 & right againſte him behinde the lyne I put. 2. Thirdlye, vnto that ſame 1286. I adde the diuiſor 643. and they are 1929. and right againſt the ſame I ſette 3. Fourthely, vnto the ſayed 1929. I adde the diuiſor 643. and they are 2572. and right againſt the ſame I put. 4. And thus muſt you doe alwayes by encreaſing ſo muche euery product, as the diuiſor dothe amounte vnto, vntyll you haue ſo done nyne tymes, as you ſee in this preſent table.

643	1
1286	2
1929	3
2572	4
3215	5
3858	6
4501	7
5144	8
5787	9

This being done, you muſt ſette downe your diuiſor vnder the diuident after the ſame maner as is before declared: that is to ſaye, 643. vnder the three firſt figures of the diuidende towarde your right hande, which are. 789. Then muſt you ſeke howe many times. 643. are conteyned in. 789. And for to knowe the ſame, I looke in my foreſaied table if I may there finde the ſame numbres, 789. the whiche is not there: Therefore I muſt take a leſſer noumbre the nereſt to it in quantitie that I can finde in the table, the whiche is. 643. whiche noumbre hathe againſt it on the ryght hande of the lyne this diget. 1. Then I take the ſayed 1. and I put it behynde the croked lyne, for the firſt fygure of the quotient.

Then I dooe abate. 643. from 789. and there remayneth. 146. the whiche I put ouer the. 789. and I cancell the 789. and thus is the fyrſt operation ended. Then I ſette forwarde the deuiſour one fygure nerer to my ryghte hande, and I ſeeke a newe quotient as I ſoughte this, where I finde the higher noumber ouer my diuiſour to bee 1464. The whiche I doe ſeeke in the table, and becauſe I can not fynde it there, I take a leſſer noumbre, the nigheſt to it that I can finde, and that is 1286: whiche noumbre hathe againſt it this digette. 2. I put. 2. for the ſeconde figure of the quotient behinde the line, and I doe abate 1286. from. 1464. and there remaineth. 178. Thirdly, I remoue forewarde the diuiſour, as before, and I finde the higher noumbre to bee. 1786. and that the nexte leſſer noumbre to it in my table, is againe. 1286. I put therefore ones againe. 2. in the quotient for the third figure: and I abate. 1286. from, 1786. and there remaineth. 500. Fourthly, I ſet forward the diuiſour, and the higher noumbre ouer it, is 5005. and the next leſſer noumbre to it in my table is. 4501. right againſt the whiche noumbre is. 7. I put my. 7

in the quotient, for the fourth figure. And after that I haue abated. 4501. from. 5005. there remayneth. 504. Finally, I remoue forwarde my diuiſor vnto the laſt place: and I finde the higher noumbre to bee. 5048. And the nexte leſſer noumbre to it in my table, is. 4501. I ſet. 7. againe in the quotient, for the fifte and laſt figure. Then I take. 4501. from. 5048. and there remaineth. 547. whiche muſt bee put at the ende of the whole quotiẽt with the diuiſor vnder it, and a lyne betwene them in this maner folowing.

$(12277\ \frac{547}{643}$

¶ The ſumme of diuiſion.

When you would diuide any nũbre by. 10. you muſt take away yͤ laſt figure nexte towardes your right hand & the reſt ſhalbe yͤ quotient. As if you would diuide. 46845. by. 10. take away the. 5. and then. 4684. ſhal bee the quotient, and the. 5, ſhalbe the nombre that doth remaine, Likewiſe when you woulde diuide any numbꝛe by 100. take awaye the twoo laſt figures towardes your right hande, and if you woulde diuide by. 1000. take away thꝛée figures, if by. 10000. take away foure figures. And ſo of all other, when the firſt figure of the dyuiſoꝛ towarde the lefte hande ſhalbe onely 1. and the reſt of theſame diuiſoꝛ being but cyphers.

¶ *Here foloweth the proofes of* addicion, ſubſtraction, multiplication, and diuiſion.

¶The profe of Addition.

WHen you would pꝛoue whether your addicion be well made, conſider the figures of the noumber whiche bée added, euery one in his ſimple value: not hauinge any regarde to the place where he ſtandeth, but to recken him as though he were alone by himſelfe and then recken them all, one after an other, caſting away from them the noumber of 9. as ofte as you maye.

And after your diſcourſe made, kepe in minde the ſame figure which remaineth after the nynes bee taken away, or ſet the ſame in a voyde place at the vpper ende of a line. For if your addicion be well made, the like figure will remaine, after that you haue taken away all the nines, out of the totall ſumme of the ſame addicion, as often as you may ther finde any: as in this addiciō whiche here you ſe. Ther remaineth. 2. for eche part.

24567	2
5329	
431	
30377	2

¶ The profe of ſubſtraction.

ADde the noumbre whiche you doe ſubſtract with that numbre which remaineth after the ſubſtraction, is made: and if the totall ſomme of that addicion, be like vnto the nombre frō the whiche the ſubſtraction was made you haue done well, otherwyſe not: as in this example doth appeare, where you ſee the nombre whiche is to be ſubſtracted is, 3584. and the noumbre whiche doth remayne, is. 1879. the whiche twoo ſummes being added together, dooe make. 5463. whiche is like to the higher noumbre, out of the whiche the ſubſtraction was made, as before is ſaied.

5463
3584
1879
5463

¶The profe of multiplication.

THe profe of multiplication is made by the helpe of diuiſion, for if you diuide the nombre produced of the multiplicatiō, by the multiplier: you ſhall finde the higher noumbre, whiche is the multiplicande.

¶The profe of diuiſion.

TO knowe if your diuiſion be well made: you muſt multiplie all the quotient by your diuiſor, and if any thinge remained after your diuiſion was made. Theſame ſhall you adde vnto the producte whiche commeth of the multiplication: and you ſhal finde the like nombre vnto your diuidend if you haue wel diuided: otherwiſe not.

¶Of progreſſion the vi. Chapiter.

Progreſſion arithmetical.

PRogreſſion arithmetical, is a briefe & ſpedy aſſembling or adding together of diuers figures or nombres, euery one ſurmounting the other cōtinually by equall difference: as 1.2.3.4.5.&c. here the differēce, from the firſt to the ſecōd is but of 1. and ſo do al the other, euery one excede another by 1. ſtill to thend. Like waies. Here. 2.4.6.8.&c. do proceede by the difference of 2. alſo 3.6.9.12.&c. doe euery one differ from other by 3. and ſo may theſe noumbres continue. Infinitelie after this order, in adding vnto the thirde noumbre, the quantitie wherein the ſeconde dothe differ from the fyrſte; Lyke wayes addinge the ſame difference vnto the fowerth noumbre, alſo to the fyfte, and ſo vnto all the other. As.1.4. the difference of the ſeconde to the fyrſt is 3.adde 3. vnto 4: and they are 7. for the thirde noumbre: Then adde 3.vnto 7: and thei make 10. for the fowrth noumbre, and ſo of all other.

Then if you will adde quickely the noumbre of any progeſſion, you ſhall dooe thus, firſt tel howe many noumbres there are, and wryte their ſomme downe by it ſelfe, as in this example, 2.5.8.11.14. where the noumbres are 5. as you maye ſée, therefore you muſt ſette downe 5. in a place alone, as I haue done here in the margent. 5. Then ſhall you adde the firſt noumbre and the laſt together, whiche in this exaumple are.14. and 2. and they make. 16. take halfe thereof whiche is.8. and multiplie it by the 5. whiche I nooted in the margente for the noumbre of the places, and the ſomme whiche amounteth of that multipliplicacion, is the iuſt ſomme of al thoſe figures added together, as in this exãple:8. multiplied by.5.doe make.40. and that is the ſomme of all the figures. An other example of parcels that are euen, as thus. 1.2.3.4.5.6. in this exãple you muſt likewaies note doun the nomber of the places, as before is taught, and thã adde together the laſt nomber and the firſt. And the ſomme, whiche cometh of that addicion, ſhall you multiplie by halfe the nomber of the places, whiche before are noted, and that, whiche reſulteth of the ſame multiplicacion, is the whole ſomme of all thoſe figures, as in this former example, where the nomber of the places is.6.I note the.6.a part, and then 6. I adde.6. and.1. together, whiche are the laſte and firſte nombers, and thei make.7. the whiche I multiplie by.3. whiche is halfe the nomber of places, and thei make 21 and ſo moche amounteth all thoſe figures, added together.

Progreſſion geometricall.

Progreſſion Geometricall is, when

the ſecond nomber containeth the firſt in any proporcion:2.3.or.4.times and ſo forthe. And in like proporcion ſhall the thirde nomber contain the ſecond, and the fowerth, the third, and the fift the fowerth. &c. As. 2.4.8.16.32,64: here the proporcion is double.

Likewaies.3.9.27.81.243.are in triple proporcion.

And.2.8.32.128.512.are in proportion quadruple.

That is to ſaie, in the firſte example, where the proporcion is double, euery nomber containeth the other.2. tymes. In the ſeconde example of triple proporcion,the noumbers exceade eche other thre times. And in the third example, the nombers exceade eche other fower times,and thus you ſe that progreſſion Arithmeticalle, differeth from Progreſſion Geometricalle for that, that in the Arithmeticalle.
The exceſſe is onelie in quantitie,but in the Geometricalle, the exceſſe is in proporcion.

Nowe if you will eaſelie finde the ſomme of any ſoche nombers, you ſhal dooe thus, conſider by what noumber thei be multiplied, whether by.2.3.4. 5: or any other, and by theſame nomber, you muſt multiply the laſt ſomme in the progreſſion. And from the producte of theſame multiplicacion, you ſhall abate the firſt nomber of the progreſſion. And that whiche remaineth of the ſaied multiplicacion, you ſhall diuide by. 1. leſſe then was the nomber, by the which I did multiplie. And the quocient ſhall ſhew you the ſōme of all the nombers in any Progreſſion. As in this exaumple.5.15.45.135. 405. whiche are in triple proporcion: now muſte you multiplie. 405. by.3. and thei are.1215. from the which you ſhall abate the firſt nomber of the progreſſion, whiche is.5: and there reſteth 1210. the whiche you ſhall diuide by the nōber leſſe by.1. then by the which you did multiplie, that is to ſaie, by.2: and you ſhall finde in the quociēt 605:

which is the total ſomme of the nombers of that progreſſion. Like wiſe. 4. 16. 64 256. 1024. whiche are in proporcion quadruple: therfore multiplie 1024. by. 4. and thereof cometh 4096 from the whiche abate the firſte nomber. 4. and there reſteth. 4092: The whiche you muſt diuide by. 3. and you ſhall finde in your quotiente. 1364. whiche is the total ſomme of that progreſſion, and this ſhalbe ſufficient for progreſſion.

¶ The. vii. chapiter treateth of the Rule of. 3. called the golden Rule.

The rule of three is the chifeſt the moſte profitable, and the moſte excellent rule of al the rules of Arithmetike. For al other rules haue nede of it, and it paſſeth all the other, for the whiche cauſe it is ſaied, that the Philoſophers did name it the golden rule. And after others opinion and iudgement, it is cal led the rule of proporcions of noumbers. But now in theſe daies, by vs it is called the rule of thre, becauſe it requireth three nombers in his operacion. Of the whiche three nombers, the twoo firſt are ſet in a certain proporcion. And in ſoche proporcion as thei bee ſtabliſhed, this rule ſerueth to finde out vnto the third nomber, the fourth nomber to hym proporcioned, in ſoche ſort as the ſecond is proporcioned vnto the firſte. Not for that, that the fower noumbers, nor yet the three, are or bee proporcionall, or ſet in one proporcion, but ſoche proporcion, as is from the firſte to the ſeconde, ought to bee from the thirde vnto the fowerth, that is to ſaie, if the ſeconde noumber dooe conteine the firſte twoo tymes or more, ſo many tymes ſhal the fowerth nomber conteine the thirde. And note well that the firſte nomber, and the thirde in euery rule of three, oughte and muſt bee alwaies ſemblable, and of one condicion. And the ſecond nomber, and the fowerth muſte likewiſe bee of one ſembleaunce and nature. And are diſſemblaunte, and contrarie to the other twoo noumbers: that is to ſaie to the firſte, and the thirde. And if you dooe multiplie the firſte by the fowerth. And the ſeconde noumber by the thirde. The twoo multiplicacions will bee egall. Likewiſe if you diuide the one ſembleaunte by the other, that is to ſaie, the thirde noumber by the firſte. And likewiſe the one diſſembleaunte by the other: that is to ſaie, the fowerth nomber by the ſecond (which are diſſembleaunte to the other twoo nombers) your twoo quocientes will bee egall.

Regul. The ſtile of this rule is thus, you muſte ſette doune your three noumbers in a certaine order, as by example here vnder ſhall appere. And then multiplie the thirde noumber, by the ſeconde. And the producte thereof you muſte diuide by the firſte noumber, or otherwiſe, diuide the firſte noumber by the ſeconde. And the quocient thereof ſhalbee diuiſor vnto the third nomber, that is to ſaie, the thirde noumber ſhall bee diuided by the quotient of the foreſaied diuiſion , that is of the firſte noumber diuided by the ſeconde . Or otherwiſe diuide the ſeconde noumber by the firſte. And that whiche cometh into your quotiente, you ſhall multiplie it by the thirde nomber. And thus ſhall you haue the fowerth noumber, whiche you ſeke for.

¶Example.

IF.8.bee worthe.12.what are 14. worthe after the rate, or els if.8. require.12.for his proporcionall, what will.14.demaunde? The whiche three noumbers maie conuenientlie bee ſette in ſoche order, as hereafter doeth appere.

If.8. $\overline{12}$. $\overline{14}$. multiplie the thirde nomber.14.by the ſeconde, whiche is.12. And thereof commeth (for the whole producte of this multiplicacion) 168. the whiche (as the rule teacheth) you muſte diuide by the firſt nomber, that is to ſaie by.8.and thereof commeth.21. And ſo moche are the 14.worthe. This is the waie, whiche is moſte vſed.

Otherwiſe diuide.8.by.12. whiche you cannot doe, for thei are $\frac{8}{12}$. wherfore abreuie $\frac{8}{12}$ and thei are $\frac{1}{9}$ for your quotient, then diuide the thirde nomber. 14. by the ſaied $\frac{2}{3}$, and you ſhall haue. 21. as before. Or els diuide the ſeconde nomber.12.by the firſte nomber.8.thereof commeth.1.$\frac{1}{2}$.the which 1$\frac{1}{2}$ you ſhall multiplie by.14.and ther of will come.21.as is aboue ſaied, and thus muſte you dooe of all other. And although, that the noumbers of this rule maie be founde in three differences, for ſometymes thei are whole nōbers and broken together, ſometymes broken and broken together, and ſomtymes all whole nombers, if thei bee whole nombers, you muſte dooe none otherwiſe, then you did in the laſt exãple. But in caſe thei be broken noumbers, or broken and whole noumbers together, the maner and waie to dooe theim, receiueth a certaine variacion, and difficultee, accordyng to the varietie of the noumbers, the whiche operacion eaſely to doe, and vnuariablie, this rule teacheth.

The three noumbers beyng ſette doune, accordyng vnto the order of the whole noumbers aforeſaied, without any broken nomber, let. 1. bee put alwaies vnderneath euery whole nomber, with a line betwene them fracciõ wiſe, as thus $\frac{8}{1}$, and that. 1. is denominatour to euery ſoche whole nomber. When you haue whole nomber and broken, thei muſt bee reduced and added with their broken nomber, and if there bée broken nomber without any whole noumber, theſame broken muſt remain in their eſtate.

¶ A Rule.

This beyng doen, you ſhall multiplie the denominatour of the firſte nomber, by the numeratour of the ſeconde, and the producte thereof againe by the numerator of the third nomber And ſo ſhall you haue the diuidende, or nomber whiche muſte bee diuided, then multiplie the numeratour of the firſt nōber, by the denominator of the ſeconde, and the product thereof by the denominator of the third nomber, and that which cometh of this multiplicacion ſhalbe your diuiſor. Then diuide the nomber, whiche is to bee diuided, by the diuiſour, and you ſhall finde the fowerth nomber that you ſeke. Of the which maner and faſhions of the rule of .3. are diuers kindes, whereof the firſt is of 3. whole nombers, as was the laſt example, and here foloweth the ſecond

If .15. poundes doe buy me two clothes, how many clothes wil .300. poūdes buye me of the ſame price, that the twoo clothes did coſt, ſette doune your three nombers thus.

Lib. Clothes. Lib.

15. 2. 300. .1
2 $\cancel{6}\cancel{0}\cancel{0}$
600 $1\cancel{5}\cancel{5}$ (40
1

And thã as you ſee, multiplie the third nomber, whiche is. 300. li. by. 2. which is the ſecond nõber, and therof cometh 600. the whiche. 600. you muſt diuide by the firſt nõber. 15. and you ſhal find in your quotiẽt 40. whiche is. 40. clothes, and ſo many clothes ſhall I buye for. 300. li. as appereth by practiſe here aboue written. And here you muſte marke that the firſt nõber & the thirde in this queſtiõ be of one denominaciõ, and likewiſe the ſeconde & the fowerth which you haue found are of one ſemblaunce: but in caſe that the firſt nomber and the third in any queſtion: bee not of like denominacion, you muſte in workyng bryng them into one, as in this exãple folowing. If. 12. nobles do gaine me 6. nobles, how many nobles will. 48. poundes gaine me: Here you ſe that the denominaciõ of the firſt nomber is nobles,and the denominacion of the thirde, is poundes, wherefore, before you dooe procede to worke by the rule of three, you muſte firſte turne the poũdes into nobles in multiplyng.48.poundes by three nobles and thei make. 144. nobles, for that there is in euery pounde of money. 3. nobles, or otherwiſe if you will, you maie bryng the firſt nomber beyng.12 nobles, into poundes, by diuiding thē by.3.and thus ſhal your firſt and third nombers, bee brought into one denominacion. Then ſhall you ſette doune your.3.nombers in order thus.

If.12. nobles doe gaine me.6.nobles, what ſhall. 144. nobles gaine? the whiche.144.are the nobles which are in.48.li. Then multiple the third nomber. 144. by the ſeconde nomber 6.and thereof cometh 864.the whiche you muſte diuide by. 12. nobles, and thereof commeth.72.nobles.

But here it maie perchaunce make ſome menne muſe, to ſee all the three nombers in this rule of three, to bee of one denominacion, whiche can not otherwiſe bee dooen , if you reduce the third nomber, to the denominacion of the firſte. But if you will reduce the firſte nomber, to the denominacion of the thirde, that is to ſaie the. 12. nobles into poundes, then ſhall the firſte and the thirde nombers onely agree in one denominacion, and the fowerth nomber which you ſeke, ſhalbe of the ſame denominacion as is the seconde, as in the former example. If. 12. nobles doe yelde me .6. nobles, what will. 48. poundes yeld me: firſt you ſhall diuide 12. nobles by three to bryng theim in poundes, and thei ſhall bee like to the thirde nomber, whiche is alſo poundes, then will thei ſtande thus.

Poũdes.	Nobles.	Poũdes.	
4.	6.	48.	
		6.	Nobles.
		288.	288 (72
			44

There is yet a more exacte waie to worke in this rule of three, whiche is thus. You muſt marke if the third and firſt nombers in the rule of three, maie bee bothe diuided by one like diuiſor: the whiche after you haue diuided thē, you ſhall write doune eche of the quocientes orderly, in the ſaied rule of.3. euery one of theim in his owne place, as though thoſe were twoo of the nōbers of your queſtion, and not chaungyng the middle noumber, that is to ſaie the ſeconde, as thus, if.50. Crounes doe buye me.44. yardes of clothe, howe many yardes ſhall I haue for 120: here you maie ſee that the thirde and the firſte nombers, maie be diuided by.10. whiche in the thirde nomber is.12. tymes, and in the firſte.5. tymes. Wherefore you ſhall put.12. for the thirde nomber in the rule of three, in ſtede of 120: and 5. for the firſt nomber in ſtede of.50. and let.44. remain ſtill in the middeſt for the ſecond nomber, after this ſorte as foloweth, and then worke by the rule as before.

Crounes. Yardes. Crounes.

```
5.     44.      12.
       12.
      ----
       88.               3
      44               528 (105 3/5
      ----             ---
      528              388
```

Multiplie.44. by.12. and thereof commeth.528. diuide the ſame.528. by 5. and you ſhall finde in your quocient 105.$\frac{3}{5}$. and euẽ ſo many yardes ſhould you haue founde, if you had wrought the rule of thre, by the firſt nõbers propoſed. There is yet certaine other varieties, in woorkyng by the rule of three, but for that thei require the knowledge of fraccions, and becauſe thei are not ſo eaſie as this firſt waie, whiche is common, therefore content your ſelues with this ſame, vntill you haue taſted the fraccions, the whiche by gods helpe I intende to ſet forth in ſeconde part of this boke, incontinently after that I haue firſte taught you the backer rule of thꝛee.

The backer rule of thꝛe is ſo called: becauſe it requireth a contrary wooꝛkyng to that, whiche doeth the rule of thꝛee directe, whereof wee haue nowe treated. Foꝛ in the directe rule of thꝛee the greater the thirde noumber is, ſo moche the greater will the fowerth be But here in this backer rule it is contrariwiſe, foꝛ the greater the third nõber is, ſo moche leſſer will the fowerth bee. Then, where as in the *rule of.* 3. directe, the thirde noumber is multiplied by the ſeconde, and the pꝛoducte thereof diuided by the firſte. Here you muſte multiplie the ſeconde noumber by the firſte, and diuide the pꝛoducte of theſame by the thirde, and the nomber whiche commeth in the quociente, anſwereth to the queſtiõ. Foꝛ ſoche pꝛactiſe commeth often tymes in vſe: In ſoche ſoꝛte, that if you wooꝛke theſame by the rule of thꝛee directe (not hauyng a regarde vnto the Pꝛopoſicion of the queſtion) you ſhould then commit an euident and open errour.

¶ *Example.*

If 15. ſhillinges worth of wyne wyll ſerue for the ordinarye of 46. men, when the Tonne of wyne is worth 12. pounds: for how many mē will the ſame 15. ſhillings ſuffiſe whē the tonne of wyne is worth but eight poundes? It is certaine, that the lower the price is that ẏ tonne of wine doth coſt, and ſo many more perſons will the ſaid 15. ſhillings in wine ſuffiſe. Therefore ſet downe your numbers thus, if 12. poundes ſuffiſe 46. men, how many will 8. poundes ſuffiſe, you muſt multiply 46. by 12. and thereof commeth 552. the which 552. you ſhal diuide by 8, and therof commeth 69. and vnto 69. men wyll the ſaide 15. ſhillings worth in wine ſuffyſe, whē the tonne of wyne is worth but eyght poundes, as hereafter doth appere by practiſe.

Lib.	Men.	Lib.	
12.	46.	8.	
	12.		7
	92.		~~552~~ (69.
	46.		88
	552.		

Likewiſe, a meſſenger maketh a iourney in 24 dayes, when the day is but 12. houres long: how many daies ſhall hee be vppon the ſame iourney when the day is 16. houres in length? Here you muſt perceaue, yͤ the more houres are in a day, the fewer dayes wyll the meſſenger bee in going hys iourney. Therefore wryte downe your nũbers thus as here you mai ſe.

Houres.	Daies.	Houres.	
12.	24.	16.	4
	12.		~~12~~
	48.		~~288~~
	24		~~166~~
	288.		~~1~~ (18

And then multiplie 24. dayes by 12. houres, and thereof commeth 288: diuide the ſame 288. by the thyrde number 16. and you ſhall fynde 18. the which is 18. dayes, and in ſo many dayes wyll the meſſenger make hys iourney whē yͤ day is 16. houres long.

Likewyſe, when the buſhell of wheate doth coſt 3. ſhillings, the penny loafe of breade waieth 4. lib. I demaunde what the ſame pennye loafe ſhall waye, when the buſhell of wheate is worth but two ſhillings; here is to bee conſidered that the better cheape the wheate is, the heauier ſhall the peny loafe waie, and therefore write down your 3. nūbers thus.

Shill. *Lib.* *Shill.*
3. 4. 2.
3. $\cancel{1}\,\cancel{2}$
12. 2 (6.

Then multiplie 4. lib. which is the ſeconde number, by the fyrſt number 3. and they make 12. the which 12. you ſhall diuide by the thirde number 2. and thereof commeth 6. li. & ſo much muſt the peny loafe of breade waye, whē yͤ buſhel of wheate is worth but two ſhillings as may appeare.

And nowe, according to my former promiſe, ſhall follow the ſeconde parte of Arithmeticke, whiche teacheth the working by Fractions.

¶ Here endeth the firſt parte of Arithmetick.

The ſeconde part of Arithmeticke, which treateth of Fractions or broken numbers.

¶ *The firſt Chapter treateth of Fractions, or broken numbers, and the difference thereof.*

BRoken number is as much as a parte or many parts of 1. whereof there are two numbers wͭ a line betwene them both: yͭ is to ſay, yͤ one which is aboue yͤ line is called yͤ numerator. And yͤ other vnderneth yͤ line is called the denominator, as by example, thre quarters, which muſt be ſet downe thus, $\frac{3}{4}$: whereof 3. which is the higher number aboue the line is called the numerator, and 4. which is vnder yͤ line is called yͤ denominator. And it is alwaies conuenient that yͤ numerator be leſſe in number, than the denominator. For if the numerator, and yͤ denominator were egall in value: then ſhoulde they repreſent a whole number thus, as $\frac{1}{1}$, $\frac{2}{2}$, $\frac{3}{3}$, which are whole numbers: by reaſõ that the numerators of theſe, and all ſuch like, may be diuided by their denominators, and theire quotientes will allwayes be but 1. But in caſe that the numerator doe excæde hys denominator, then it is more thã one whole: as $\frac{20}{18}$, is more than a whole number by $\frac{2}{18}$, other diffinition doth not hereunto appertaine. Furthermore it is to be vnderſtande that the middeſt of all broken numbers is the iuſt half of 1. whole, as $\frac{6}{12}$, $\frac{7}{14}$, $\frac{8}{16}$, $\frac{9}{18}$, and other lyke, are the halfes of one whole number, wherof doth growe, and come forth 2. progreſſions naturall: the one progreding by augmenting, or encreaſing, as theſe.

$$\frac{1}{2}\quad\frac{2}{3}\quad\frac{3}{4}\quad\frac{4}{5}\quad\frac{5}{6}\quad\frac{6}{7}\quad\frac{7}{8}\quad\frac{8}{9}\quad\frac{9.}{10.}\ \&c.$$

And they doe procæde infinitely and

will

wyll neuer reache to make a whole number thus $\frac{1}{1}$. And the other progreſſion, doth progrede by diminiſhing or decreaſyng, as thus.

$$\frac{1}{2}\ \frac{1}{3}\ \frac{1}{4}\ \frac{1}{5}\ \frac{1}{6}\ \frac{1}{7}\ \frac{1}{8}\ \frac{1}{9}\ \frac{1}{10}.\ \text{\&c.}$$

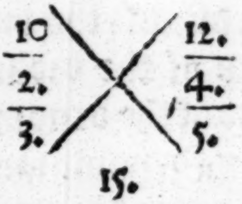
And theſe do procœde infinitely, and ſhall neuer come to make a 0. which ſignifieth nothing, but ſhall euer retaine ſome certaine number whatſoeuer, whereby it doth appeare that broken numbers are infinite.

¶ The ſeconde Chapter treateth of the reducing or bringing togither, of 2. numbers, or many broken diſſembling, vnto one broken ſembling.

REduction, is as much as to bring togither, or to put in ſēblaūce 2. or manye nūbers diſſembling one from the other, in reducynge them vnto a common denominator. For bicauſe the diuerſitie and difference of the broken numbers, doe come of the denominators part, or of diuers denominators, and for the vnderſtanding hereof, there is a general rule whoſe operation is thus. Multiplie the Denominators the one by the other, and ſo you ſhal haue a new denominator common to all, yͤ which denominator diuide by the perticuler denominators, and multiplye euery quotiẽt by his numerator and ſo you ſhall haue newe numerators, for the numbers which you woulde reduce, as appeareth by thys example followyng.

¶*Reduction in common denomination.*

I If you wyll reduce $\frac{2}{3}$ and $\frac{4}{5}$ togither, you muſt fyrſt multiplie yͤ two denominators the one by yͤ other, that is to ſay 3. by 5. maketh 15. which is your commõ denominator, that ſet vnder the croſſe, then diuide 15. by the denominator 3. & you ſhall haue 5. which multiply by the numerator 2. and you ſhall finde 10. ſet that ouer the $\frac{2}{3}$ and they are $\frac{10}{15}$, for the $\frac{2}{3}$. Afterwardes diuide 15. by the denominator 5. and thereof commeth 3. the which multiply by the numerator 4. and you ſhall finde 12. which ſet ouer the head of the $\frac{4}{5}$ and they make $\frac{12}{15}$ for the $\frac{4}{5}$: as appeareth more plainer in the margent.

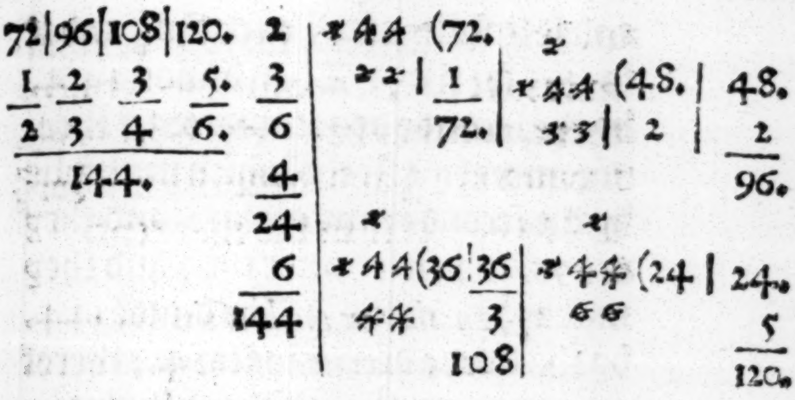


2. If you will reduce $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{5}{6}$, togither, you muſt multiplie all the denominators the one by yͤ other, that is to ſay, 2. by 3. maketh 6, then 6. by 4. and mounteth 24. Laſt of all 24. by 6. and thereof commeth 144. for the common denominator. Then, for the fyrſt diuide 144. by the denominator 2. and thereof commeth 72. the which multiplye by the numerator 1.

and it is ſtill 72. ſet yͤ ouer the $\frac{1}{2}$ and it is $\frac{72}{144}$, for the $\frac{1}{2}$: Then diuide 144. by the ſeconde denominator 3. & thereof commeth 48: the which multiplie by the ſeconde numerator 2. and they are 96. which ſet ouer the $\frac{2}{3}$ and they make $\frac{95}{144}$, for the $\frac{2}{3}$: Thē diuide 144. by the thirde denominator 4. & therof commeth 36. the which multiplye by the thyrde numerator 3. & they make 108. which ſet ouer the $\frac{3}{4}$ and they are $\frac{108}{144}$ for the $\frac{3}{4}$.

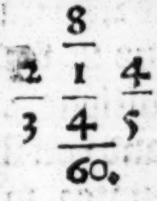
Finally diuide 144. by the laſt denominator 6, & thereof commeth 24: The which multiply by yͤ laſt numerator 5. & therof commeth 120. Which ſet ouer the $\frac{5}{6}$ and they are $\frac{120}{144}$, for the $\frac{5}{6}$, as appeareth here by practiſe.

¶*The exaumple.*



¶Reduction of broken numbers of broken.

If you wyl reduce ȳ broken of brokē togither, as thus, the $\frac{2}{3}$ of $\frac{7}{4}$ of $\frac{4}{5}$, 3 you muſt multiplyc the numerators the one by the other to make one broken number of the thre broken numbers, that is to ſaye 2. by 1. maketh 2. and then 2. by 4. maketh 8. which is your numerator. Then multiplye the Denominators the one by thc other, that is to ſaye 3. by 4. maketh 12. and then



12. by 5. maketh 60. for your denominator, ſet 8. ouer 60. wͭ a line betwene them, and they be $\frac{1}{60}$ which being abbreuied are $\frac{2}{15}$ and ſo much are yͤ $\frac{2}{3}$ of $\frac{1}{4}$ of $\frac{4}{5}$ as appereth in the margent.

¶ *Another example of the ſame reduction and of the ſeconde reduction.*

4 IF you will reduce $\frac{2}{3}$ of, $\frac{1}{4}$, of $\frac{4}{5}$, yͤ $\frac{5}{4}$, of $\frac{5}{7}$: And the $\frac{1}{2}$, of the $\frac{1}{2}$, of the $\frac{2}{3}$ of $\frac{1}{5}$. Firſt it behoueth you of euery partie of yͤ brokē nūbers to make of eche of thē one broken, as by the third reductiō is taught: yͭ is to ſay, in multiplying yͤ numerators by numerators & denominators by denominators: firſt, for yͤ fyrſt part which is $\frac{2}{3}$ of $\frac{1}{4}$ of $\frac{4}{5}$, you muſt as is ſaid before, multiplie 2. by 1. and then by 4. & you ſhall haue 8. for the numerator lykewiſe multiplie 3. by 4. and the product by 5. and you ſhal haue 60. for the denominator, ſo they make, $\frac{1}{60}$ which

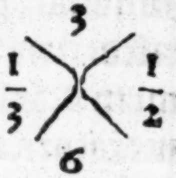
being abreuied are $\frac{2}{15}$ for ẏ firſt part, that is to ſay, for the $\frac{2}{3}$ of $\frac{1}{4}$ of $\frac{4}{5}$, ſecondely for the $\frac{3}{4}$ of $\frac{5}{7}$ multiplye lykewiſe the numerator 3. by 5. maketh 15. for ẏ numerator, & multiplie 4. by 7. maketh 28. for the denominator, and then they be $\frac{15}{29}$ for ẏ ſeconde part that is to ſay for the $\frac{3}{4}$ of $\frac{5}{7}$. Thirdely for the $\frac{1}{2}$ of $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{1}{3}$ multiply the numerators the one by the other, that is to ſay, 1. by 1. and then by 2. and laſt by 1. and al maketh but 2. for ẏ numerator, likewyſe multiplie 2. by 2. maketh 4. and 4. by 3. maketh 12. and then 12. by 3. maketh 36. for denominator, and they are $\frac{2}{36}$, which beyng abreuied maketh $\frac{1}{18}$, for the thyrde part, ẏ is to ſay for $\frac{1}{2}$ of the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{1}{3}$. Laſt of all take the $\frac{2}{15}$ the $\frac{15}{28}$ and ẏ $\frac{1}{18}$ & reduce them according to the order of the ſeconde reduction, and you ſhall finde $\frac{1008}{7560}$ for the $\frac{2}{15}$. And $\frac{4050}{7560}$ for ẏ $\frac{15}{28}$. And $\frac{420}{7560}$ for ẏ $\frac{1}{18}$: and thus are broken numbers of broken, reduced as appereth by practiſe.

$\frac{2}{9}$

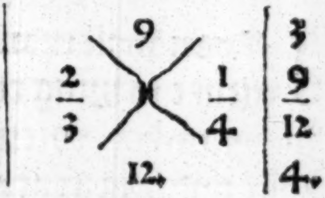
8	15	2			
2 1 4	3 5	1 1 2 1			
3 4 5	4 7	2 2 3 3	1008	4050	420
60	28	36	2	15	1
			15	28	18
				760	

¶ *Reduction of broken numbers, and the partes of broken togither.*

5 If you wyll reduce $\frac{1}{3}$ and yͤ $\frac{1}{2}$ of $\frac{1}{3}$ togither to bring them into one broken number, you muſt firſt ſet downe the $\frac{1}{3}$ and $\frac{1}{2}$ as appereth in the margēt with a croſſe betweene them, & then multiplie the twoo denominators the one by the other, that is to ſay, 2. by 3. maketh 6. ſet that vnder the croſſe, then multiplie the fyrſt Numerator, one by the laſte denominator twoo, and that maketh 2. vnto the whych adde the laſte numerator one, and they be three, whych ſet aboue your croſſe



croſſe, ſo you ſhall finde that the $\frac{1}{3}$ and the $\frac{1}{2}$ of $\frac{1}{3}$ doe make $\frac{1}{3}$ which being abbreuied dothe make $\frac{1}{3}$, which is as much as the $\frac{1}{3}$ and the $\frac{1}{2}$ of $\frac{1}{3}$. Likewiſe if you wyll reduce the $\frac{2}{3}$ and yͤ $\frac{1}{4}$ of $\frac{1}{3}$, you muſt do as before, ſet downe the $\frac{2}{3}$ and $\frac{1}{4}$ with a croſſe betweene them, multiplie the two denominators the one by yͤ other, that is to ſay, 3. by 4. maketh 12. which ſet vnder yͤ croſſe as you ſee in the margent and thē multiply the firſt numerator 2. by yͤ laſt denominator 4. and thereof commeth 8. whereunto adde the laſt numerator 1. and that maketh 9. which ſet ouer the Croſſe, ſo ſhall you finde that the $\frac{2}{3}$ and the $\frac{1}{4}$ of $\frac{1}{3}$ are worth $\frac{9}{12}$, which abbreuied doe make $\frac{1}{4}$, as appeareth by example in the margent.

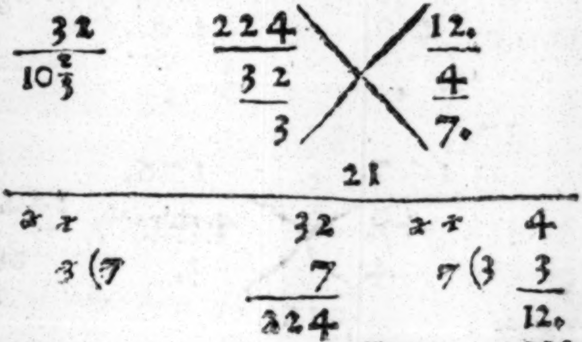


Reduction of whole numbers and broken togither into a Fraction.

6 If you will reduce whole number with broken, you muſte bring the whole number into broken, as by this exāple may appere: reduce 17. $\frac{5}{8}$ into a broken number, firſt you muſt multiplye the whole number 17. by the denominator of the brokē, which is eight in ſaying eight times 17. doe make 136. vnto the which you muſt adde the numerator of $\frac{5}{8}$ which is 5. and all amounteth to 141. which ſet ouer 8. with a line betweene them, & thei wil be $\frac{141}{8}$ ſo much is 17. $\frac{1}{8}$ worth in a Fraction as appeareth here by practiſe.

17.		141.	
8.		5.	
136.	17.	8.	maketh $\frac{141.}{8.}$
5.			
141.			

In caſe you haue whole number and broken to bee reduced, with broken you muſte bring the whole number into his broken, in multiplying it by the denominator of the broken number going therwith, and adde thereunto the numerator of the ſaide broken number, as in the laſte example, and then reduce that brokē number wyth the other broken, as here appereth by this example. Reduce $10.\frac{2}{3}$ & $\frac{4}{7}$ togither, firſt bring $10\frac{2}{3}$ al into thirds, as by the ſyxt reduction, and you ſhal finde $\frac{32}{3}$, then reduce the $\frac{32}{3}$ and $\frac{4}{7}$ togither, by the fyrſte reduction, and you ſhall finde $\frac{224}{21}$ for the $\frac{32}{3}$: and $\frac{12}{21}$ for $\frac{4}{7}$, as appereth here by practiſe.

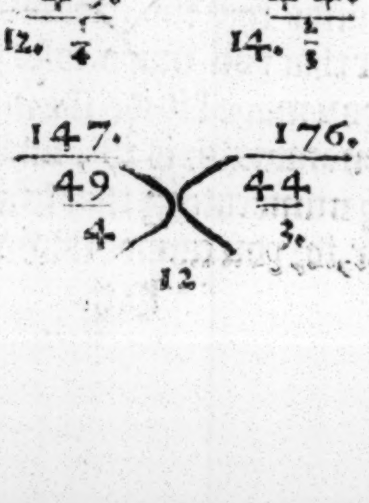


+ 4

Alſo in caſe you haue in both partes of your Reduction, as well whole number as brokē, you muſt alwayes put the whole into their broken (as by the fyrſte reduction) of either part.

¶ *Example.*

If you wyll reduce 12. $\frac{1}{4}$ with 14. $\frac{2}{3}$ to bring them into one denomination, fyrſt bring the 12. $\frac{1}{4}$ all into fourthes, and you ſhall fynde $\frac{49}{4}$: then likewiſe reduce 14. $\frac{2}{3}$ all into thirdes, and you ſhall haue $\frac{44}{3}$, for the 14. $\frac{2}{3}$, then reduce $\frac{49}{4}$ and $\frac{44}{3}$ togither, by the order of the fyrſt Reduction, and you ſhall fynde $\frac{147}{12}$ for the $\frac{49}{4}$. And $\frac{170}{12}$ for yͤ 14. $\frac{2}{3}$ as here by practiſe doth plainly appere.



The

¶*The thirde Chapter treateth of abbreuiation of one great broken number into a leſſer broken.*

ABbreuiation is aſmuch as to ſet downe, or to write a brokē nūber by figures of leſſe ſignification, & not diminiſhing yͤ value thereof. The which to doe, there is a rule whoſe operation is thus, diuide yͤ numerator and likewiſe the denominator, by one whole number the greateſt yͭ you may fynde in the ſame broken number, & of the quotient of that numerator, make it the numerator, and likewiſe of that of the denominator make it your denominator, as by example.

1. If you wyl abreuiat $\frac{54}{81}$, you ſhal vnderſtande that the greateſt whole number that you maye take, by the which you maye diuide the numerator & denominator is 27, which is yͤ half of yͤ numerator, & that is a whole number, for you cannot take a whole

number out of the denominator, 81. but that there will bee either more or leſſe than a whole number, therefore if you diuide 54. by 27. you ſhall finde 2. for the numerator, likewiſe if you diuide 81. by 27. you ſhall finde 3. for the denominator, then put 2. ouer the 3. with a line betwene thē, and you ſhal find $\frac{2}{3}$ and thus by this rule the $\frac{54}{81}$ are abreuied vnto $\frac{2}{3}$, as appeareth in the margent, and ſo is to be vnderſtande all other.

$\frac{54.}{81.}$

x
27
27 (2

$\frac{2}{3}$

a
8 x
27 (3

¶ The forme ⁊ maner how to finde out the greater number, by the which you mai wholy diuide yͤ numerator ⁊ denominator (to thende yͭ you may abreuiat them) is thus.

Firſt

Fyrſt, diuide the denominator by hys numerator, and if anye number doe remaine, let your diuiſor be diuided by the ſame number, and ſo you muſt continue vntyll you haue ſo diuided ẏ there may nothing remaine, then is it to be vnderſtande, that your laſt diuiſor (wherat you did ende, and that o. did remaine after your laſt diuiſion) is the greateſt number, by the which you muſt abreuiat, as you did in the laſte example, but in caſe that your laſt diuiſor be 1. it is a token that the ſame nūber can not be abreuied. Example, of $\frac{54}{11}$ diuide 81. (which is the denominator) by 54. which is his numerator, and there reſteth 27. then diuide 54. by 27. and there remaineth nothing, wherefore your laſt diuiſor 27. is the number, by the which you muſt abreuiat $\frac{54}{81}$ as in the laſt example is ſpecifyed.

Another ſtile of abbreuiation.

2. Mediate the numerator, and alſo the denominator of your fraction in caſe the numbers be euen, that is to ſaye, take allwayes the halfe of the numerator, and likewiſe of the denominator, and of yͤ mediation or halfe of the numerator, make it your numerator, alſo of $\frac{1}{2}$ the denominator, make your denominator, and ſo continue as often as you may in takyng allwayes the $\frac{1}{2}$ of the numerator, and ſemblablie of the denominator, or elſe ſee if you may abbreuiate yͤ numbers which doe remaine, by 3. by 4. by 5. 6. 7. 8. 9. or by 10; for you muſt abbreuiate them as often as you can by any of the ſaide numbers, and it is to bee noted, that with whatſoeuer nūber of theſe, you doe abbreuiate the Numerator of your Fraction, by the ſame you muſt abbreuiate lykewyſe the Denominator, ſo continuyng vntill they can no more bee abbreuied. And it is to bee vnderſtande that if the Numerator and the Denomi-

nominator be euen numbers, as you may knowe when the fyrſt fygure is an euen number, or a 0, maye you perceaue if both the Numerator and the Denominator may be abbreuied by 10. by 8. by 4. or by 2. although that ſome times they maye bee abbreuied by thre. And if thei be odde numbers, then muſt you conſider if they maye bee abbreuied by 9. by 7. by 5. or by 3: but when the fyrſt number, as well of the Numerator, as of the Denominator are euen numbers, then may you wel knowe that ſuch numbers maye bee abbreuied by 2. as is aforeſaide. And if you adde the fygures of the Numerator togither, in ſuch manner as you doe in makyng the proofe by nine in whole numbers: that is, if you fynde 9. it appeareth that you maye abbreuye that number by 9. And lykewiſe by 3. and ſometimes by 6. if you fynde 6. it maye bee abbreuied by 6. and alwaies by 3. if you finde 3. it is a ſigne that you may abreuiate by 3. And by whatſoeuer number that you doe abreuiate the numerator, by the ſame muſt you abreuiate likewyſe the denominator, and if the fyrſt fygures of the ſame number be. 5. or 0. you may abreuiate them by 5. but if the fyrſte fygures be both 0. they may be abreuied by 10. in cutting awaye the twoo Cyphers thus, as $\frac{2}{3}\big|\frac{0}{0}$ which maketh $\frac{2}{3}$, as ſometimes by 100. thus, as $\frac{1}{2}\big|\frac{00}{00}$ in cutting away the foure ciphers after this ſort, $\frac{1}{2}\big|\frac{00}{00}$ and then the $\frac{100}{200}$ doe make $\frac{1}{2}$, and after this maner haue I ſet here diuers examples, although that all numbers cannot be abreuied by this rule, that is to ſaye, all thoſe which may bee well abreuyed by the fyrſte rule aforeſaide.

Abꝛeuiated.

by	10.	$\frac{3840}{7680}$	by	9.	$\frac{1890}{4725}$
by	8.	$\frac{384}{768}$	by	7.	$\frac{210}{525}$
by	6.	$\frac{48}{69}$	by	5.	$\frac{30}{75}$
by	4.	$\frac{8}{15}$	by	3.	$\frac{6}{15}$
by	2.	$\frac{2}{4}$			$\frac{2}{6}$
		$\frac{1}{2}$			

3. Furthermoꝛe you ſhall vnderſtande that ſometimes it happeneth, that all the fygures of the numeratoꝛ are egall vnto them of the denominatoꝛ, which whē it ſo happeneth, you may thē take one of them of the numeratoꝛ, and alſo one of them of the denominatoꝛ, and it ſhall bee abꝛeuyed as $\frac{555}{888}$, being abꝛeuiated after this maner cōmeth to $\frac{5}{8}$. And yet it happeneth ſometimes, that two, oꝛ many fygures of the numeratoꝛ are pꝛopoꝛtioned vnto two, oꝛ many fy-

gures of their denominators and the other fygures of the ſame number doe beholde the one the other in thys proportion: Then may you take two or many figures, as well of the numerator as of the denominator, and by this maner the ſame number ſhal be abbreuied, as $\frac{4747}{5959}$ which being abbreuied by this rule, do come to $\frac{47}{59}$.

4. Alſo it happeneth ſometimes yͤ you ſhoulde abbreuiate one number vnto the ſemblaunce or likeneſſe of another. And for to know if the ſame may be abbreuied, and alſo by what number it maye bee abbreuied, you muſt diuide the numerator of yͤ one number by the numerator of the other, and likewiſe the denominator of the one by the denominator of the other, for in caſe that after euery diuiſion there doe remaine 0. and that the two quotients be egall, then is one of them the number by yͤ which the ſaide fraction muſt be abbreuied, as by exãple of $\frac{115}{207}$. I would know if

they maye be abbreuied vnto $\frac{5}{9}$, and for to doe this, you muſt diuide 115. by 5. and you muſt diuide 207. by 9. and there will come into both the quotients 23. by the whych it appeareth yͭ this number may be abbreuied by 23.

$\frac{5}{9}$. $\frac{115}{207}$ $\cancel{1}\cancel{1}\cancel{5}$ $\cancel{8}$

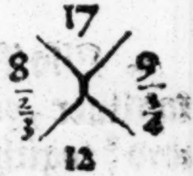
$\cancel{5}\cancel{5}$ (23 $\cancel{2}\cancel{0}\cancel{7}$

$\cancel{9}\cancel{9}$ (23.

¶ *The 4. Chapter treateth of the aſſembling of two or many broken numbers togither, as by example.*

FOr to adde broken numbers togither, there is a generall rule, which is thus, if yͤ nūbers be vnlike the one to yͤ other you muſt reduce thē into a cōmon denominatiō, which after you haue reduced thē, you muſt then adde both the numerators togither, & ſet yͤ product of the ſaide addition ouer the croſſe, & diuide the ſame by the cōmon denominator as by this exāple folowing.

1. If you wyll adde $\frac{2}{3}$ with $\frac{3}{4}$, you muſt fyrſt reduce the two fractions both into one denomination, according to the introduction of the fyrſte reduction, that is to ſaye, in multiplying the denominator of the firſte fraction which is 3, by the denominator of the other fraction whiche is foure, and they make 12. for your common denominator, yͤ which 12. ſet vnder the croſſe, thē multiplie yͤ fyrſt numerator 2. by the laſt denominator 4. and thereof commeth 8. which ſet ouer the $\frac{2}{3}$, and then multiply yͤ laſt numerator 3. by the fyrſt denominator 3. and thereof commeth 9. which you muſt ſet ouer the $\frac{3}{4}$, then adde the numerator 8. with the numerator 9. & they make 17. which ſet ouer the croſſe, and then your fraction wyll be $\frac{17}{12}$ which is the addition of the $\frac{2}{3}$ wyth $\frac{3}{4}$. And by-



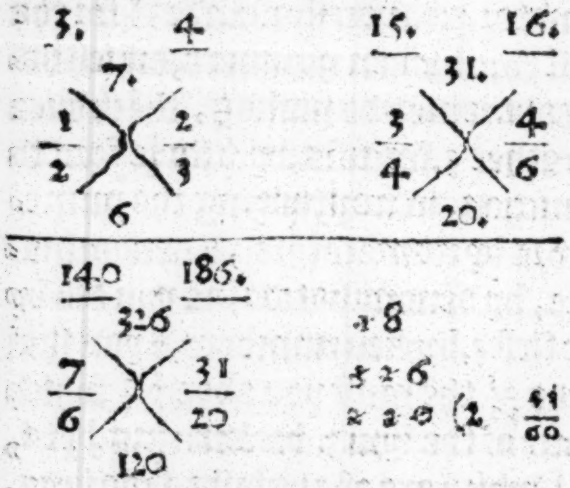
5
✱ 7
✱ 2   (1 $\frac{5}{12}$

cauſe your numeratoꝛ 17. is greater thā his denominatoꝛ 12. therfoꝛe you muſt diuide 17. by 12. and thereof will come 1. and 5. remaining, which 5. are woꝛth $\frac{5}{12}$, and ſo much are ỹ $\frac{2}{3}$ added with $\frac{3}{4}$ as doth appere.

¶ *Addition in broken numbers.*

2. Alſo if you wyll adde $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, togither, you muſte fyꝛſte adde the $\frac{1}{2}$ and $\frac{2}{3}$ togither, accoꝛding to the doctrine of the laſte rule, and you ſhall finde $\frac{7}{6}$: then adde $\frac{3}{4}$ and $\frac{4}{5}$ togither by the ſaide laſt chapter, and they make $\frac{31}{20}$. Then finally adde the $\frac{7}{6}$ (which came of the $\frac{1}{2}$ and $\frac{2}{3}$ added togither) with $\frac{13}{20}$, & you ſhall fynde by ỹ foreſaide addition that they amount vnto $\frac{326}{120}$. Wherefoꝛe diuide 326. by 120. & therof cōmeth 2. and 86. remaineth, which is $\frac{86}{120}$ of one whole, & thei being abꝛeuied do make $\frac{43}{60}$: & thus ỹ $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, added togither doe amount to 2. $\frac{43}{60}$,

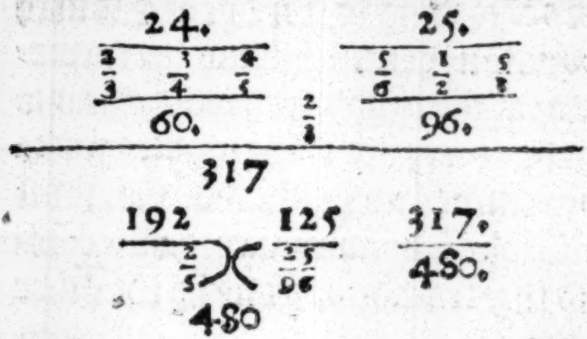
as here vnder doth appere.



¶ *Addition of broken numbers of broken.*

3. Furthermore, if you will adde the broken numbers of broken togither, as to adde the $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$ with the $\frac{3}{6}$ of $\frac{1}{2}$ of $\frac{5}{8}$: firſt you muſt reduce ỹ nũbers according to ỹ order of ỹ fourth reduction, in multiplying the numerator of the fyrſt 3. fractions, the one by the other, and of the product make your numerator, & likewiſe you muſt multiplie ỹ denominators of ỹ foreſaid thre fractions, ỹ one by the other

and of the product make your denominator, and you ſhal finde $\frac{24}{60}$ for the fyrſt thre broken numbers, which being abbreuied do make $\frac{2}{5}$, thē reduce the other 3. fractiōs, by yͤ ſaide fourth reduction, in multiplying the numeratōrs by numerators, & denominators, by denominators, as you did by the firſt 3. broken numbers, & you ſhal finde $\frac{25}{96}$ thē muſt you adde yͤ $\frac{2}{5}$ which came of the fyrſt 3. broken numbers, & $\frac{25}{96}$ which are of the laſt 3. fractions, both togither, by the inſtruction of yͤ firſt additiō & you ſhal find $\frac{317}{480}$ which cannot be abbreuied, but is yͤ product of yͤ additiō: ſo much are the $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$ added with the $\frac{5}{6}$ of $\frac{1}{2}$ of $\frac{5}{8}$ as hereafter by practiſe doth euidently appere.

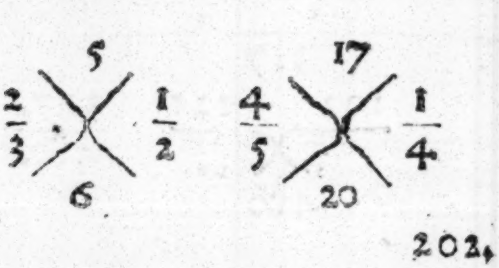


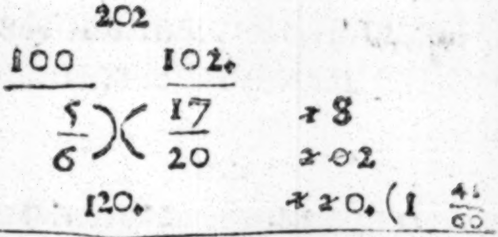
Addi-

¶ *Addition of broken number with the partes of broken togither.*

4. Likewiſe if you will adde the $\frac{2}{3}$, and the $\frac{1}{2}$ of $\frac{1}{3}$ with the $\frac{4}{5}$ and $\frac{1}{4}$ of $\frac{1}{5}$, you muſt reduce the $\frac{2}{3}$ $\frac{1}{2}$ by the fyſt reduction and therof cōmeth $\frac{5}{6}$ for the $\frac{2}{3}$ & $\frac{1}{2}$, of one of the ſaide thirdes, thē reduce the $\frac{4}{5}$ and $\frac{1}{4}$ by the ſaide fift reduction, and thereof commeth $\frac{17}{20}$.

Laſt of all adde the $\frac{5}{6}$ and $\frac{17}{20}$ togither according to the fyrſt rule of additiō, and you ſhall fynde $\frac{202}{120}$ which beyng diuided bringeth 1. & $\frac{82}{120}$ part remaining, which abreuied maketh $\frac{41}{60}$ and thus you doe perceaue that the $\frac{2}{3}$ & $\frac{1}{2}$ added with the $\frac{4}{5}$ and $\frac{1}{4}$ doe amount vnto 1. $\frac{41}{60}$ as hereafter by practiſe doth plainely appere.

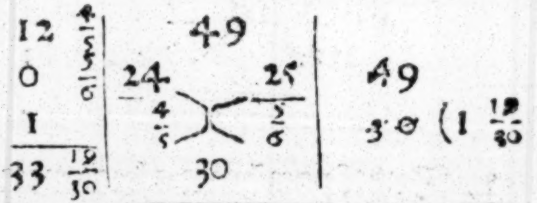


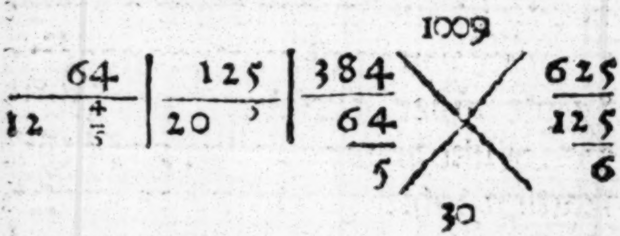


¶ *Addition of whole number and broken togither.*

5. Alſo if you will adde 12. $\frac{4}{5}$ with 20. $\frac{5}{6}$, you may (if you will) adde 12. & 20. togither, and they make 32. & then adde the two broken numbers togither, that is to ſaye $\frac{4}{5}$ and $\frac{5}{6}$ by yͤ order of the fyrſt addition & they make $\frac{49}{30}$: therefore diuide 49. by 30. and thereof commeth 1. and $\frac{19}{30}$ partes remaine, which 1. you muſt adde vnto the 32. & the whole addition wil be 33. $\frac{19}{30}$, or otherwiſe, you may reduce 12. $\frac{4}{5}$ into the likeneſſe of a Fraction by the fyrſt reduction and they will be $\frac{64}{5}$, & likewiſe by the ſame reductiõ, reduce 20. $\frac{5}{6}$ and they bee $\frac{125}{6}$, then adde $\frac{64}{5}$ with the $\frac{125}{6}$, by the fyrſt addition and you ſhall fynde $\frac{1009}{30}$. Therefore diuide 1009. by 30. and therof commeth 33. $\frac{19}{30}$

as before, & as by practiſe of the ſame both the wayes, doth here vnder appere.

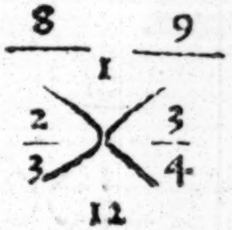




¶ The fiſt Chapter treateth of Subſtraction in broken numbers.

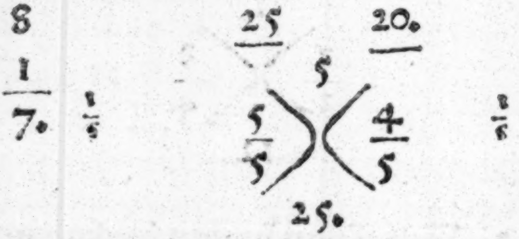
IF you wyll ſubſtract $\frac{2}{3}$ from $\frac{3}{4}$ you muſt fyrſt reduce bothe the fractions into a common denomination by the fyrſt reduction, and you ſhall fynde $\frac{8}{12}$ for the $\frac{2}{3}$, and $\frac{9}{12}$ for the $\frac{3}{4}$. Therefore abate the numerator 8. from the numerator 9. & there remaineth $\frac{1}{12}$ as maye appere here by practiſe.

8 9

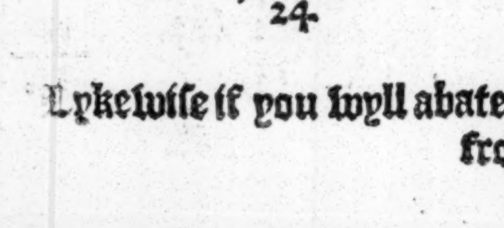


2. But if you haue a broken number to be ſubſtracted from a whole number, you muſt borowe one of the whole nūber, & reſolue it into a fraction of like denomination as is that fraction, which you woulde abate frō the ſame whole nūber, & then abate yͤ ſaide fraction therefrom, & you ſhall finde what doth remaine, as by thys example. If you abate $\frac{4}{5}$ from 8. you muſt borow one of the ſaid 8, and reſolue it into fiftes like vnto yͤ fractiō, bicauſe it is 4. fifts, and that 1. will be 5. fiftes thus $\frac{5}{5}$, therfore abate $\frac{4}{5}$ from $\frac{5}{5}$ & there will remain $\frac{1}{5}$, and ſubſtract yͤ 1. which you borowed from 8. and there doth remaine 7. and alſo the $\frac{1}{5}$. Thus the $\frac{4}{5}$ being ſubſtracted from 8. doth leaue 7. $\frac{1}{3}$ as by practiſe dothe

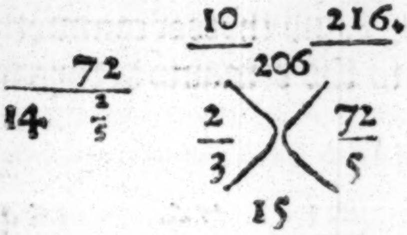
plainely appeare.

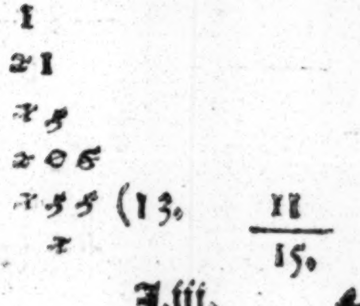


3. If you will ſubſtract broken nūber from whole number and broken being togither: thus, as if you would ſubſtract $\frac{3}{4}$ from 6. $\frac{5}{6}$, you may by the fyrſt ſubſtraction, abate $\frac{3}{4}$ from $\frac{5}{6}$, and there wil remaine $\frac{1}{12}$, and the 6. doth ſtill remaine whole, bicauſe yͤ $\frac{3}{4}$ may bee abated from the $\frac{5}{6}$, thus $\frac{3}{4}$ being abated from 6 $\frac{5}{6}$ leaueth 6. $\frac{1}{12}$ as appereth by practiſe.



Lykewiſe if you wyll abate $\frac{2}{3}$, from 14. $\frac{2}{5}$, you muſt fyrſt reduce 14. $\frac{2}{5}$ all into fiftes by the 6. reduction, and they be $\frac{72}{5}$, then reduce $\frac{2}{3}$ into a common denomination, by the fyrſte reduction, and you ſhall fynde $\frac{10}{15}$ for the $\frac{2}{3}$: and $\frac{216}{15}$ for the $\frac{72}{5}$: thē ſubſtract the numerator 10. of the fyrſt fraction, from the numerator 216. of yͤ ſeconde fractiō, & there remaineth $\frac{206}{15}$. Therfore diuide 206. by 15. and therof commeth 13. $\frac{11}{15}$, and ſo much remaine of this ſubſtraction, as may appere.





To Reduce is [illegible]

4. If you will ſubſtract whole nūber and brokē from whole & broken, as thus, if you will ſubſtract 9. $\frac{1}{4}$ frō 20. $\frac{1}{2}$ you muſte reduce 9. $\frac{1}{4}$ into fourthes, & likewiſe ẏ 20. $\frac{1}{2}$ into halfes by ẏ ſyrt reduction: & you ſhal find $\frac{37}{4}$ for ẏ 9. $\frac{1}{4}$ And $\frac{41}{2}$. for ẏ 20. $\frac{1}{2}$. Thē reduce $\frac{37}{4}$. and $\frac{41}{2}$ into one denomination, according vnto the fyrſte reduction and you ſhall fynde $\frac{74}{8}$ for the $\frac{37}{4}$, and $\frac{164}{8}$ for the $\frac{41}{2}$ thē abate the numerator of $\frac{74}{8}$ which is 74. from the numerator of $\frac{164}{8}$ and there remaineth $\frac{90}{8}$ then diuide 90. by 8. and thereof commeth 11. $\frac{1}{4}$ which is the remaine of thys ſubſtraction.

$\frac{37}{9.\ \frac{1}{4}}$ $\frac{41}{20.\ \frac{1}{2}}$

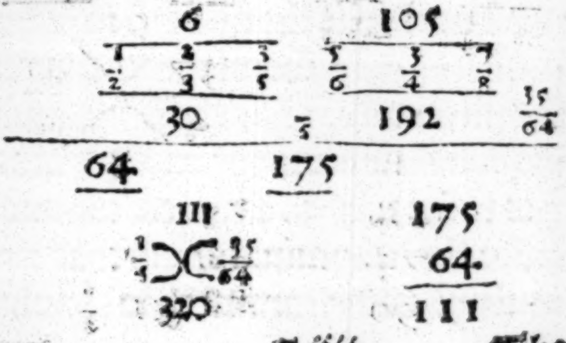
$$\begin{array}{ccc} \underline{74} & 90 & \underline{164} \\ \frac{37}{4} & \times & \frac{41}{2} \\ & 8 & \end{array}$$

$$\begin{array}{r} 164 \\ \underline{74} \\ 90 \end{array}$$

```
 32
 90
 88 (11 1/4
```

¶ Subſtraction of broken numbers of broken.

5. If you will ſubſtract, the $\frac{2}{1}$ of $\frac{2}{3}$ of $\frac{3}{5}$ frō the $\frac{5}{6}$ of $\frac{3}{4}$ of $\frac{7}{8}$ you muſt firſt bring the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{5}$ into one fraction by yͤ 3. reduction, & the $\frac{3}{6}$ of $\frac{3}{4}$ of $\frac{7}{8}$ likewiſe into one fraction by yͤ ſame reduction, & you ſhall fynde $\frac{6}{30}$ for the fyrſt 3. brokē numbers, which being abbreuied do make $\frac{1}{5}$: & for the other 3. brokē numbers, you ſhal finde $\frac{105}{192}$: which being likewiſe abbreuied do make $\frac{35}{64}$, then you ſhal ſubſtract $\frac{1}{5}$ frō $\frac{35}{64}$ by yͤ inſtructiō of yͤ firſt ſubſtractiō, in reducing both yͤ fractiōs into a cōmon denomination, as before is done, & you ſhall find remaining $\frac{111}{320}$ as may appere by example.

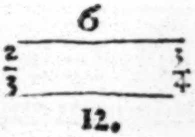


¶*The ſixt Chapter is of multiplication in broken numbers.*

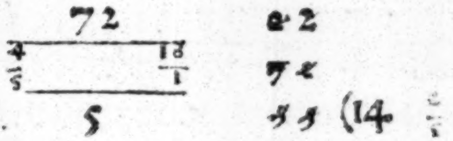
FIrſt foꝛ to multiplie in bꝛokē nūber, there is a rule which is thus, multiply the numeratoꝛ of the one fractiō by the numeratoꝛ of the other. And then diuide yͤ fraction if you may, oꝛ elſe abbꝛeuiate it, and you haue done, but if there be whole number & bꝛokē togither, you muſte reduce the whole nūbers into bꝛoken, & adde thereunto the numeratoꝛ of his bꝛoken, and thē multiply as is befoꝛe ſaide, as alſo hereafter by examples ſhall moꝛe plainely appere.

1. If you wyll multiply $\frac{2}{3}$ by $\frac{3}{4}$, you muſt multiplie the numeratoꝛ 2. by yͤ numeratoꝛ 3. & therof commeth 6. foꝛ the numeratoꝛ: Likewiſe multiplye the denominatoꝛs the one by yͤ other, yͭ is to ſay 3. by 4. & thereof commeth 12. foꝛ the denominatoꝛ, ſo that thys multiplication commeth to $\frac{6}{12}$, which

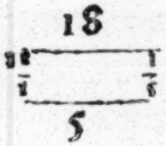
being abbreuiated doe make $\frac{1}{2}$ and ſo much amounteth the multiplication of the $\frac{2}{3}$ by $\frac{3}{4}$ as by practiſe.

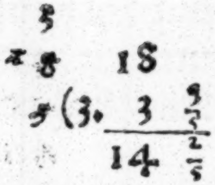


2. Likewiſe if you will multiplye a broken number by whole number, or whole number by broken, which is all one, as $\frac{4}{5}$ by 18, or elſe 18. by $\frac{4}{5}$, you muſt ſet 1. vnder 18. thus $\frac{8}{1}$: and thē multiply 18. by the numerator 4. and thereof commeth 72. yͤ which diuide by the denominator 5. & thereof commeth 14. $\frac{2}{5}$ for the whole multiplication, or otherwiſe abate from 18. his $\frac{1}{5}$ part which is 3. $\frac{3}{5}$, and there remaineth 14. $\frac{2}{5}$ as aboue.

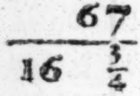


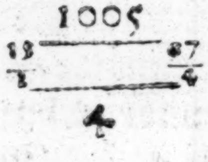
Alſo

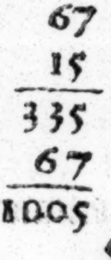




3. Alſo if you wil multiply a whole number, by whole number and broken, or elſe whole number & broken by a whole number, which is al one. As by example, if you multiplye 15. by 16. $\frac{3}{4}$ or elſe 16. $\frac{3}{4}$ by 15. Firſt reduce 16 $\frac{3}{4}$ all into fourthes, in multiplying 16. by the denominator of $\frac{3}{4}$ whych is 4. and therof commeth 64. whereunto adde the numerator 3. and it maketh $\frac{67}{4}$ which multiplie by $\frac{15}{1}$ according unto the inſtruction of the laſte example, & you ſhall finde yͤ product of this multiplication to be 251. $\frac{1}{4}$ as by practiſe doth here appere.





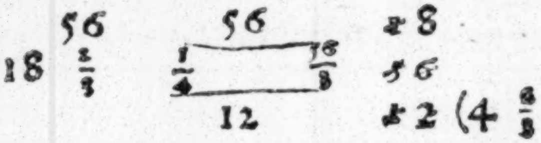


And

2 1
1005
444 (251. $\frac{1}{4}$

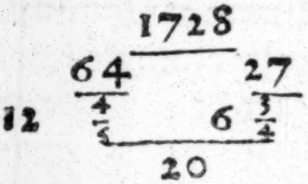
4. And if you wyll multiplye a broken number, by whole number and broken, or elſe whole number & broken by a broken. As by example, if you wil multiplie $\frac{1}{4}$ by 18. $\frac{2}{3}$, or elſe 18. $\frac{2}{3}$ by $\frac{1}{4}$, which is all one: you muſt reduce the whole number into hys broken by the ſyxt reduction. And you ſhall fynde $\frac{56}{3}$, which you ſhal multiplie by the $\frac{1}{4}$, after the doctrine of the firſt multiplication, that is to ſay: in multiplying the Numerator 56. by yͤ Numerator of $\frac{1}{4}$, which is 1. And it is ſtill 56. bicauſe 1. doth neither multiplie nor diuide. And likewiſe you muſt multiplye the Denominator 3. by the Denominator 4. and it maketh 12. thē diuide 56. by 12. and thereof commeth 4. $\frac{2}{3}$. And ſo muche

amounteth the multiplication of the 18. $\frac{2}{3}$ multiplyed by $\frac{1}{4}$ as by example.



5. If you wyll multiplye whole number and broken, with whole and broken, you muſte fyrſte put eyther whole number into hys broken, according to the inſtruction of the ſyxte reduction, and then multiply the one numerator by the other, and of the product make your numerator. And likewiſe multiply the denominators the one by the other, and thereof make the denominator, then diuide the numerator by the denominator, and the quotient ſhal be the encreaſe of thys multiplication. *Example*, If you woulde multiplye 12. $\frac{4}{5}$ by 6. $\frac{3}{4}$: fyrſt by the ſyxt reduction the 12. $\frac{4}{5}$ will make $\frac{64}{5}$, and the 6. $\frac{3}{4}$ wyll make $\frac{27}{4}$, then multiplye the numerator 64.

by the numerator 27. and therof commeth 1728. for the numerator. And then you muſt multiply the denominator 5. by the denominator 4. and they doe make 20. then diuide 1728. by 20. and thereof commeth 86. $\frac{2}{5}$ for the whole multiplication, as by example.



64
27
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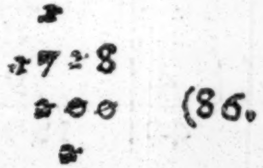
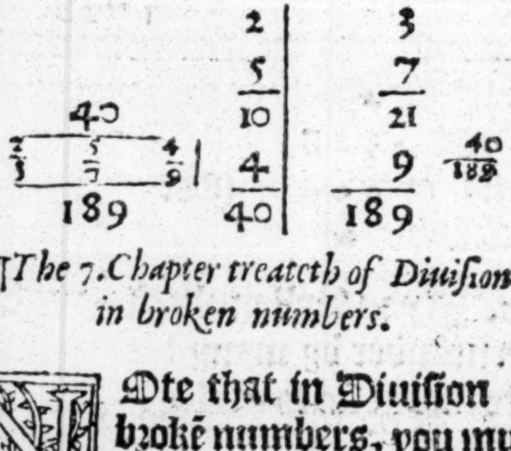
128
1728



6. If you wyll multiplie one broken number by many broken numbers, thus: As to multiply $\frac{2}{3}$ by $\frac{5}{7}$ & by $\frac{4}{9}$: you muſt multiply yͤ numerators of al the fractiōs, yͤ one by the other, & of the product make yͤ numerator yͤ

is to ſaye: 2. by 5. and they be 10. then 10. by 4. and they be 40. for the Numerator. Likewiſe you muſte multiply the denominators the one by the other, that is toſay 3. by 7. maketh 21. then 21. by 9. maketh 189. for the denominator: then ſet 40. ouer the 189 wyth a line betwœne them, and they make $\frac{40}{189}$. And ſo much amounteth the whole multiplicatiō of the $\frac{2}{3}$ multiplied by $\frac{5}{7}$ and $\frac{4}{9}$ as by example folowing. And thus is to be vnderſtand of all ſuch lyke.

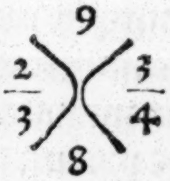


¶*The 7. Chapter treateth of Diuiſion in broken numbers.*

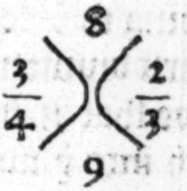
NOte that in Diuiſion of brokē numbers, you muſt ſette your diuiſor downe fyrſt, next vnto the lefte hande, and the diuidende or number which is to bee diuided alwaies towarde the right hande. And then multiplie croſſe wiſe, that is to ſaye the numerator of your diuiſor by the denominator of the diuidende, and the product ſhalbe the denominator, which afterwarde ſhall bee your Diuiſor. And lykewiſe you muſt multiplie the Denominator of your fyrſte number, that is to ſaye of your Diuiſor: by the Numerator of the Diuidende, which afterwarde ſhall be the Diuidend, and that muſt be ſet ouer the Croſſe, and the Denominator vnder the Croſſe, then ſhall you diuide the Numerator by the Denominator if it maye bee diuided, if not, you muſt abbreuiate them, as hereafter by exaumples ſhall more plainelye appere.

1. If you will diuide $\frac{3}{4}$ by $\frac{2}{3}$, you muſte ſette the Diuiſor (which is $\frac{2}{3}$) next to the lefte hande, and the

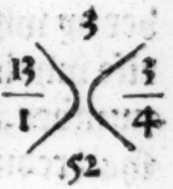
diuidende $\frac{3}{4}$ toward your right hand, with a croſſe betwene them: as may appere by this example in the margent. Then you ſhal multiply yͤ numerator of yͤ $\frac{2}{3}$, which is 2. by yͤ denominator of the $\frac{3}{4}$ which is 4. and and thereof commeth 8. which ſhalbe your new diuiſor: ſet that 8. vnder the croſſe, as the denominator, then multiply the numerator of the diuidende, that is to ſaye of the $\frac{3}{4}$ which is 3. by the denominator of the diuiſor, that is to wit of the $\frac{2}{3}$ which is 3. ſet yͤ ouer the croſſe, and it is 9. for the numerator, which ſhalbe now the diuidende, or number to be diuided. Thē finally you ſhall diuide 9. by 8. and thereof commeth into yͤ quotiēt 1. $\frac{1}{8}$, and ſo oftentimes is $\frac{2}{3}$ conteined in $\frac{3}{4}$. as doth appere before in the margent. But in caſe you woulde diuide $\frac{2}{3}$ by $\frac{3}{4}$, you muſte lykewiſe ſet your



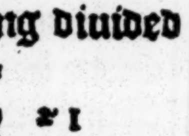
diuiſor $\frac{3}{4}$ next to your left hande, as is before ſaide. And then procœde, as is aboue declared, & you ſhal finde that $\frac{2}{3}$ diuided by $\frac{3}{4}$ bringeth into the quotient $\frac{8}{9}$, which cannot be diuided nor abbreuied, wherfore it appereth that $\frac{2}{3}$ diuided by $\frac{3}{4}$ bringeth but $\frac{8}{9}$ of one vnitie into the quotient as doth appere.



2. Likewiſe if you wil diuide a broken number by a whole number or elſe a whole number by a broken, as to diuide $\frac{3}{4}$ by 13. you ſhall put 1. vnder 13. and it wil be $\frac{13}{1}$ which is your diuiſor, ſet yͤ toward your left hande, and then multiply 13. by 4. accordig to yͤ firſt diuiſion, & thereof commeth 52. for the de-



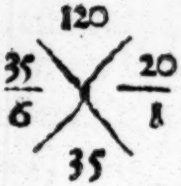
nominator, ſet that vnder yͤ croſſe & multiply 3. by 1. which is 3. for the numerator, that ſet ouer the croſſe, and it is $\frac{3}{52}$ as appeareth in the margent. But if you will diuide 13. by $\frac{3}{4}$ thē ſet the $\frac{3}{4}$ next your left hand and put one vnder 13. as in the laſt example, & it is $\frac{13}{1}$ ſet yͤ toward your right hande thus, as appeareth in the margent, and then worke according to yͤ doctrine of the firſt diuiſion, & you ſhall finde that 13. being diuided by $\frac{3}{4}$ bringeth into yͤ quotient $\frac{52}{3}$, then diuide 52. by 3. and therof commeth 17. $\frac{1}{3}$, and ſo oftentimes is $\frac{3}{4}$ conteined in 13. as doth appere.

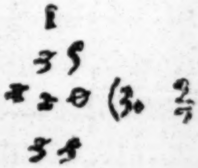


$\cancel{2}$ 1
$\cancel{5}$ $\cancel{2}$
$\cancel{3}$ $\cancel{3}$ (17. $\frac{1}{3}$

3. And if you will diuide whole nūber by whole number and broken, or elſe whole nūber and brokē by whole number, as to diuide 20. by 5. $\frac{5}{6}$, you ſhall reduce 5. $\frac{5}{6}$ into his broken by yͤ firſt reduction, & it maketh $\frac{35}{6}$ for your

diuiſor, then put 1. vnder 20. And it wyll bee $\frac{20}{1}$, then ſhal you multiply 35. by 1. and 20. by 6. as is taught in the other diuiſions, and you ſhall finde $\frac{120}{35}$: then diuide 120. by 35. and you ſhall fynde in your quotient 3. $\frac{5}{7}$ & ſo many tymes is 5. $\frac{5}{6}$ conteined in 20. as in the margent doth appere.



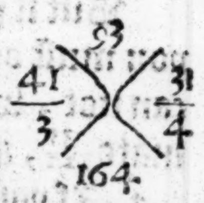


But if you wyll diuide 5. $\frac{5}{6}$ by 20. you muſt diuide 35. by 120, which you can not, wherefore you ſhall abbreuiate $\frac{35}{120}$, and thereof commeth. $\frac{7}{24}$.

4. If you will diuide a broken nūber, by whole number and broken, or elſe a whole number and broken, by a broken number. As to diuide $\frac{3}{4}$ by 13. $\frac{2}{3}$, you muſte reduce 13. $\frac{2}{3}$, into hys broken, by the ſyxte reduction

And they be $\frac{41}{3}$ for your diuiſor, then multiplye 41. by 4. & they make 164. for your denominator, likewiſe multiplye 3. by 3. and they make 9. for the numerator, and then will your ſume be $\frac{9}{164}$. But if you will diuide 13. $\frac{2}{3}$ by $\frac{3}{4}$ then you muſt diuide 164. by 9. and you ſhall fynde 18. $\frac{2}{9}$.

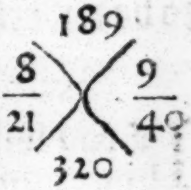
5. If you will diuide whole number and broken, by whole number & broken, as to diuide 7. $\frac{3}{4}$ by 13. $\frac{2}{3}$ you muſt reduce the whole numbers into their broken, by the doctrine of the firſt reduction, & you ſhall fynde $\frac{31}{4}$ for the 7. $\frac{3}{4}$, & $\frac{41}{3}$ for the 13. $\frac{2}{3}$.



Then ſet downe $\frac{41}{3}$ towarde the left hande bycauſe it is your diuiſor, and the $\frac{31}{4}$ towarde the right hande, and multiplie 41. by 4. for your denominator, and thereof commeth 164. Likewyſe multiply 31. by 3. for your Numerator, and it amounteth to 93. the whych diuiſion wyll bee thus $\frac{93}{164}$ as before doth appere.

But if you will diuide 13. $\frac{2}{3}$ by 7. $\frac{3}{4}$ you muſte contrariwyſe to the other example, diuide 164. by 93. and you ſhall fynde in the quotient 1. $\frac{71}{93}$.

6. The broken numbers of broken, muſt be diuided in ſuch maner as broken numbers are, & there is no difference, ſauing only that of many brokē numbers you muſt make but two broken numbers, that is to ſay yͤ diuiſor, and the diuidend, or number that is to be diuided, example. If you will diuide the $\frac{3}{4}$ of $\frac{3}{5}$ of $\frac{1}{2}$, by the $\frac{2}{3}$ of $\frac{4}{7}$. For the fyrſt, the $\frac{3}{4}$ of $\frac{3}{5}$ of $\frac{1}{2}$ are $\frac{9}{40}$ by the thirde reduction: and yͤ $\frac{2}{3}$ of $\frac{4}{7}$ are by the ſame Reductiō $\frac{8}{21}$, then haue you $\frac{8}{21}$ for your diuiſor, & $\frac{9}{40}$ for your number to bee diuided, then multiply 8. by 40. which maketh 320. ſet that vnder the croſſe and multiply 9. by 21; & thereof cōmeth 189. which ſet ouer yͤ croſſe for the numerator, and they



make $\frac{189}{320}$ for this diuiſion as doth apere.

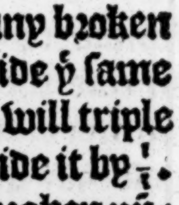
But if you woulde diuide $\frac{8}{21}$ by $\frac{9}{40}$. you muſt worke contrary to the laſte example, that is to ſaye, you muſt diuide 320. by 189. And therof commeth in the quotient 1. $\frac{131}{189}$.

¶*The eyght Chapter treateth of duplation, triplation, and quadruplation of all broken numbers.*

If you wyll double any broken number, you ſhal diuide ẏ ſame by $\frac{1}{2}$: likewiſe if you will triple any fraction you muſt diuide it by $\frac{1}{3}$. And for to quaduple any broken nũber, you ſhall diuide it by $\frac{1}{4}$, and ſo is to be vnderſtande of all other.

Example of Duplation.

If you wil double $\frac{3}{8}$ you ſhal diuide $\frac{3}{8}$ by $\frac{1}{2}$, and thereof commeth $\frac{6}{8}$, which being abbreuied are $\frac{3}{4}$: as by example.



Or otherwiſe, in caſe the denominator of any fraction bee an euen number, you may take halfe the ſayde denominator, without anye other operation, and the nnmerator to abyde ſtill ẏ numerator, vnto the ſaid halfe of the denominator of the Fractiō, as by the other exāple before rehearſed: that is to ſay of $\frac{3}{8}$, take $\frac{1}{2}$ of 8. which is 4. and that is the denominator, and 3. remaineth ſtil numerator to 4. and it maketh $\frac{3}{4}$ and ſo of all other. But in caſe the denominator bee an odde number, that is to ſay, not euen, thē you may multiply the numerator by 2. or elſe double ẏ numerator, which is al one thing, and that fraction ſhal bee doubled. Example, if you will double $\frac{3}{5}$ you muſt only multiply the numerator 3. by 2. & they be 6. which maketh that fraction to be $\frac{6}{5}$, ẏ which 6. being diuided by 5. bringeth 1. $\frac{1}{5}$ and ſo much is the double of $\frac{3}{5}$.

Example of Triplation.

If you will triple $\frac{3}{5}$ you muſt diuide $\frac{3}{5}$ by $\frac{1}{5}$ and thereof commeth $\frac{9}{5}$ whiche beinge diuided bryngeth 1 $\frac{4}{5}$, or otherwiſe, bicauſe the denominator is an odde number you may multiplie the numerator 3. by 3, and thereof commeth 9. which maketh $\frac{9}{3}$ as before.

Example of quadruplacion.

If you will quadruple $\frac{4}{5}$, you ſhall diuide $\frac{4}{5}$ by $\frac{1}{4}$ and thereof commeth $\frac{16}{5}$ which 16. being diuided by 5. bringeth 3 $\frac{1}{5}$, or otherwiſe, bicauſe the denominator of yͤ fraction is an odde nūber, you ſhall multiplie the numerator of the $\frac{4}{5}$ that is to ſay 4. by 4. and therof commeth 16. the which diuide by 5. and you ſhall finde 3. $\frac{1}{5}$ as before, and this ſufficeth for duplacion, triplaciō and quadruplacion.

¶The 9. Chapter treateth of the prooues of broken numbers. And firſt of Reductiō.

If you doe abbreuiate yͤ broken nūbers which bee reduced, you ſhall retourne them into their firſt eſtate: as by example, if you reduce $\frac{2}{5}$ with $\frac{4}{5}$ you ſhall fynde $\frac{10}{15}$ and $\frac{12}{15}$, then abbreuiate $\frac{10}{15}$ and you ſhall finde $\frac{2}{3}$, abbreuiate likewyſe $\frac{12}{15}$ and therof commeth $\frac{4}{5}$ as before.

The proofe of Abbreuiation.

If you doe multiplye that number which you haue abbreuied by that or thoſe numbers, by the which you haue abbreuied them, you ſhall returne them againe into theire fyrſt eſtate. Example, if you will abbreuiate $\frac{32}{48}$ by 16. in taking yͤ $\frac{1}{16}$ part both of the numerator, and alſo of the denominator, you ſhall finde $\frac{2}{3}$, yͤ proofe is thus, you muſt multiplye both the numerator & denominator of $\frac{2}{3}$ by 16. that is to ſay, three by 16. maketh 48. for yͤ denominator, & 2. by 16. maketh 32. for the numerator, thē ſet the numerator 32. ouer the denominator 48 and they be $\frac{12}{48}$ as befoꝛe.

The proofe of Addition.

If you doe ſubſtract one of the nũbers, oꝛ manye of them (which you haue added) from the totall ſumme, there ſhal remaine yͤ other, oꝛ others. Example: if you do adde $\frac{1}{3}$ with $\frac{1}{4}$ you ſhall fynde $\frac{7}{12}$. The pꝛoofe is, if you ſubſtract $\frac{1}{3}$ from $\frac{7}{12}$ you ſhall fynde remaining the other number which is $\frac{1}{4}$, oꝛ elſe if you doe ſubſtract $\frac{1}{4}$ frõ $\frac{7}{12}$ there wil remaine the other number, which is $\frac{1}{3}$.

The proofe of Subſtraction.

If you do adde that number which remaineth, with the number whych you did ſubſtract, you ſhall fynde the totall ſumme, oute of the which you made yͤ abatemẽt: oꝛ otherwiſe, if you adde yͤ two leſſer numbers togither, you ſhal finde the greater. Example:

if you doe abate or ſubſtracte $\frac{1}{4}$ from $\frac{1}{3}$ there wyll remaine $\frac{1}{12}$. The proofe is thus: you muſt adde $\frac{1}{12}$ & $\frac{1}{4}$ togither, and you ſhall fynde $\frac{1}{3}$, which is the greateſt number.

The proofe of Multiplication.

If you diuide the producte of the whole multiplication, by the multiplicator, you ſhall fynde in your quotient, the multiplicande or number by the which you haue multiplyed: or elſe if you diuide the total ſum which is come of the multiplication, by the multiplicande: you ſhall finde in the quotiẽt the multiplicator. Example, if you multiply $\frac{2}{3}$ by $\frac{4}{5}$, the product of this multiplication will bee $\frac{8}{15}$. The proofe is thus: you ſhal diuide $\frac{8}{15}$ by yͤ multiplicator $\frac{4}{5}$, and therof cõmeth $\frac{2}{3}$. Or els diuide $\frac{8}{15}$ by $\frac{2}{3}$ & you ſhal finde the $\frac{4}{5}$ which is the multiplicator.

The proofe of Diuiſion.

The proofe of Diuiſion.

If you doe multiplye the quotient by the diuiſor, you ſhall finde the nũber which you did diuide, yͭ is to ſay, your diuidende. Example: if you diuide $\frac{2}{3}$ by $\frac{3}{4}$, your quotient wil bee $\frac{8}{9}$ yͤ proofe is thus, you muſt multiply $\frac{8}{9}$ by $\frac{3}{4}$, and thereof commeth $\frac{24}{36}$ which being abbreuiated are $\frac{2}{3}$ whiche is your diuidende, & by this maner all whole numbers haue theire proofes as well as broken numbers.

The tenth Chapter treateth of certaine queſtions done by broken numbers. And firſt by Reduction.

I Finde two numbers, wherof the $\frac{2}{7}$ of the one number may bee egal vnto the $\frac{3}{8}$ of yͤ other. *Aunſwere:* you ſhal reduce $\frac{2}{7}$ & $\frac{3}{8}$ croſſewiſe, and you ſhall fynde 16. ouer the $\frac{2}{7}$ and 21. ouer the $\frac{3}{8}$, which are yͤ two numbers that you ſeeke: for yͤ $\frac{3}{8}$ of 16. are 6. and ſo are the $\frac{2}{7}$ of 21. lykewiſe 6. wherefore you may perceaue that the $\frac{3}{8}$ of 16. which are 6. are egall vnto the $\frac{2}{7}$ of 21. which is alſo 6.

2. Finde two numbers, whereof yͤ $\frac{2}{3}$ of the one may be double to the $\frac{1}{4}$ of the other. *Aunſwere:* double $\frac{1}{4}$ & you ſhal haue $\frac{2}{4}$, which being abbreuiated is $\frac{1}{2}$: thẽ reduce $\frac{2}{3}$ & $\frac{1}{2}$ croſſewiſe, & you ſhall finde 4. ouer the $\frac{2}{3}$ & three ouer the $\frac{1}{2}$ which are the two numbers yͤ you ſeeke. For yͤ $\frac{2}{3}$ of 3. which is 2. is double vnto the $\frac{1}{4}$ of 4. which is but 1.

3. Finde two numbers whereof the $\frac{1}{3}$ and the $\frac{1}{4}$ of the one, maye bee egall vnto the $\frac{1}{4}$ & $\frac{1}{5}$ of the other. *Aunſwere:* Adde the $\frac{1}{3}$ and $\frac{1}{4}$ togither, and they make $\frac{7}{12}$ then adde $\frac{1}{4}$ and $\frac{1}{5}$ togither, & they are $\frac{9}{20}$, thẽ reduce $\frac{7}{17}$ & $\frac{9}{20}$ croſſewiſe, & you ſhall haue 140. ouer the $\frac{7}{12}$ & 108. ouer the $\frac{9}{20}$, which are the two nũbers that you ſeeke. For 63. which are the $\frac{7}{12}$ of 108. are alſo the $\frac{9}{20}$ of 140.

4. Finde two numbers, whereof yͤ $\frac{1}{2}$ the $\frac{1}{3}$ and the $\frac{1}{4}$ of the one of them, may be egall vnto the $\frac{1}{5}$ the $\frac{1}{6}$ and $\frac{1}{7}$ of the other number. *Aunſwere:* firſt you

muſt adde $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ togither, & they make $\frac{13}{12}$: then adde $\frac{1}{5}$, $\frac{1}{6}$ and $\frac{1}{7}$ togither, & they make $\frac{107}{210}$. Then reduce $\frac{13}{12}$ and $\frac{107}{210}$ croſſewiſe, as by the fyrſt queſtion of reduction, and you ſhall finde 2730. ouer the $\frac{13}{12}$ and 1284. ouer the $\frac{107}{210}$, which are the two numbers that you ſeeke: for 1391 which is the $\frac{1}{2}$ the $\frac{1}{3}$ and $\frac{1}{4}$ of 1284. is lyke to the $\frac{1}{5}$ $\frac{1}{6}$ & $\frac{1}{7}$ of 2730, which is alſo 1391.

5. Finde three numbers, whereof the $\frac{2}{5}$ of yͤ firſt, the $\frac{3}{7}$ of the ſeconde, & the $\frac{4}{9}$ of the thirde, may be egall the one to the other. *Aunſwere:* ſet downe the $\frac{2}{5}$ $\frac{3}{7}$ and $\frac{4}{9}$, and then multiplie the Denominator of the $\frac{2}{5}$ that is to ſay 5. by the Numerators of the other two Fractions, that is to ſay, by the Numerator of $\frac{3}{7}$, and by the Numerator of $\frac{4}{9}$, which is 3. and 4. And thereof commeth 60. for your fyrſt number, then ſhall you multiplye the Denominator of the $\frac{3}{7}$ which is 7. by the Numerators of $\frac{1}{5}$ and $\frac{4}{9}$, that to to ſay by 2. and 4. and thereof commeth 56.

for the ſeconde number. Then multiplie the Denominator of $\frac{4}{9}$, that is 9. by the Numerators of $\frac{2}{5}$ and $\frac{3}{7}$ that is by 2. and by 3. and therof commeth 54. for the thirde number.

And thus the $\frac{2}{5}$ of 60. which is 24. is likewiſe the $\frac{3}{7}$ of 56. which is the ſecond number: and the $\frac{4}{9}$ of 54. which is the thyrde number.

6. Finde three numbers, of which the fyrſte and the ſeconde may bee in ſuch proporcion as $\frac{1}{2}$ and $\frac{1}{3}$, and the ſeconde and thirde in ſuche proportion as $\frac{1}{4}$ and $\frac{1}{5}$. *Aunſwere:* reduce $\frac{1}{2}$ and $\frac{1}{3}$ croſſewiſe, and you ſhall haue 3. ouer the $\frac{1}{2}$ and 2. ouer the $\frac{1}{3}$, then reduce $\frac{1}{4}$ and $\frac{1}{5}$ in lyke maner, and you ſhall fynde 5. ouer the $\frac{1}{4}$ and 4. ouer the $\frac{1}{5}$. Then ſay by the Rule of three, if 5. do gyue mee 4. what ſhall two gyue mee, which is the ſeconde proportional, multiply the ſeconde number 4. by the thyrde number two, and therof commeth eyght, the which diuide

by the firſt numbers.and therof commeth 1. $\frac{3}{5}$ for the thirde proportionall, and you ſhal fynde that 3.2.1. $\frac{3}{5}$ are the three numbers proportionall that I demaunde, or elſe 15. 10. & 8. in whole numbers.

1. What number is that, vnto the which if you doe adde 13. the whole amounteth to 31. *Aunſwere*: rebate 13. from 31. and there wyll remaine 18. which is the number that you ſeeke.

2. What number is that, vnto the which if you adde $\frac{2}{5}$ the addition wyll be $\frac{5}{6}$. *Aunſwere*: : abate $\frac{2}{5}$ from $\frac{5}{6}$, and there will remaine $\frac{13}{30}$, which is the number that you deſyre.

3. What nūber is that, whereunto if you adde 7. $\frac{2}{3}$, the whole additiō will be 12. $\frac{1}{4}$. *Aunſwere*: abate 7. $\frac{2}{3}$ frō 12. $\frac{1}{4}$. & the remaine will be 4. $\frac{7}{12}$ which is the number yͭ you deſire to know.

4. What number is that, whereunto if you adde the $\frac{1}{4}$ of it ſelfe, that is to ſay, of the nūber that you ſeeke, the whole addition may be $\frac{5}{6}$.

Aunſwere: Here foloweth a generall rule for all ſuch like queſtions. Fyrſt, of 3. which is yͤ numerator of $\frac{3}{4}$ make ſtill the numerator and likewiſe of 3. and 4. togither, which is both yͤ numerator, and the denominator of the $\frac{3}{4}$ make your denominator, ſo you ſhal finde $\frac{3}{7}$, then take the $\frac{3}{7}$ of $\frac{5}{6}$ which is $\frac{15}{42}$ or $\frac{5}{14}$, and ſubſtract them from $\frac{5}{6}$, and there wyll remaine $\frac{10}{21}$ which is the number that you ſeeke.

5. What number is that, vnto the which if you adde his owne $\frac{2}{3}$ yͤ is to ſay $\frac{2}{3}$ of it ſelfe, yͤ whole addition ſhall bee 20. *Aunſwere:* doe as in the laſte queſtion; of the numerator of $\frac{2}{3}$, that is to ſaye, of 2. make ſtill your numerator. And likewiſe of yͤ numerator. 2. and the denominator 3. of the $\frac{2}{3}$, make of them both, your denominator, and you ſhall finde $\frac{2}{5}$, thē take the $\frac{2}{5}$ of 20. which are 8. And abate them from 20. and there will remaine 12. which is the number that you deſyre and ſo is to bee done of all ſuche lyke rea-

ſons.

1. What number is that, from the which if you do abate 17. the reſt may be 19. *Aunſwere*: adde 17. and 19. togither and you ſhall finde 36. which is the number that you ſeeke.

2. What number is that, from the which if you abate $\frac{3}{5}$ the reſt maye be $\frac{1}{8}$. *Aunſwere*: adde $\frac{3}{5}$ and $\frac{1}{8}$ togither: and you ſhall finde $\frac{29}{40}$ whiche is the number that you demaunde.

3. What number is that, from the which if you deduct 13. $\frac{1}{2}$ the reſt maye be 5. $\frac{5}{7}$. *Aunſwere*: adde 13. $\frac{1}{2}$ and 5. $\frac{5}{7}$ together, and thereof commeth 19. $\frac{3}{14}$, which is the number that you ſeeke.

4. What number is that, from yͤ which if you ſubſtracte hys $\frac{2}{5}$ the reſt may be. 12. *Aunſwere:* ꝑ a rule foꝛ ſuch like reaſons, yͭ is to ſaye frõ the denominatoꝛ of $\frac{2}{5}$ which is 5. abate 2. which is his numeratoꝛ, and there reſteth 3. foꝛ yͤ denominatoꝛ, and thus of $\frac{2}{5}$ you haue now made $\frac{7}{3}$, then take the $\frac{2}{3}$ of 12. which are 8; and adde them vnto 12.

12. and thereof commeth 20. for the number which you deſyre.

5. What number is that, from the which if you doe abate hys $\frac{3}{4}$, the reſt maye be $\frac{8}{9}$. *Aunſwere:* from the Denominator of $\frac{3}{4}$ which is 4. ſubſtracte hys Numerator 3. and there reſteth 1. Thus of $\frac{3}{4}$ you haue made $\frac{3}{1}$. Then multiplye $\frac{3}{1}$ by $\frac{8}{9}$, and thereof commeth 2 $\frac{2}{3}$, the which adde vnto $\frac{8}{9}$, and you ſhal haue 3. $\frac{5}{9}$, which is the number that you ſæke.

6. What number is that, from the which if you abate his $\frac{4}{5}$, the reſt maye be 12. $\frac{2}{3}$. *Aunſwere:* Doe as you dyd in the laſte queſtion, and you ſhal fynde that the $\frac{4}{5}$ wil bee $\frac{4}{1}$. And therfore multiplie 12. $\frac{2}{3}$ by $\frac{4}{1}$, and thereof commeth 50. $\frac{2}{3}$, the which adde vnto 12. $\frac{2}{3}$, and you ſhal fynde 93. $\frac{1}{3}$, for the number that you demaunde. And thus of all ſuch lyke queſtions.

1. What number is that, which being multiplied by 13. the whole.

Multiplication ſhall mount to 221. *Aunſwere :* diuide 221. by 13. and thereof commeth 17. which is the number that you ſeeke.

2. What number is that which being multipled by 15. yͤ whole multiplication wil amoũt to $\frac{3}{4}$. *Aunſwere:* diuide $\frac{1}{4}$ by $\frac{15}{1}$ and therof commeth $\frac{1}{20}$ which is the number, that you ſæke.

3. What number is that, which being multiplyed by 21. the whole multiplication wil be 16 $\frac{4}{5}$. *Aunſwere:* diuide 16. $\frac{4}{5}$ by $\frac{21}{1}$, and you ſhall finde $\frac{4}{5}$ whych is the number that you demaunde.

4. What number is that, which being multiplyed by $\frac{3}{4}$ the multiplication will amount to 18. *Aunſwere :* diuide $\frac{18}{1}$ by $\frac{3}{4}$, and thereof commeth 24. which is the number that you deſyre to knowe.

5. What number is that, which if it be multiplied by $\frac{2}{3}$ the whole multiplication wyll bæ $\frac{1}{4}$. *Aunſwere:* diuide $\frac{1}{4}$ by $\frac{2}{3}$ and the quotient will bæ $\frac{3}{8}$

which is yͤ number that you require to know.

6. What number is that, whych beyng multiplied by $\frac{5}{8}$, the product of yͤ multiplicatiõ wil be 16. $\frac{2}{3}$. *Aunſwere:* diuide 16. $\frac{2}{3}$ by $\frac{5}{8}$ and thereof commeth 26. $\frac{2}{3}$ which is the nũber yͭ you ſeeke.

¶ Here enſueth other neceſſarie Queſtions, which are wrought by Multiplicatiõ in broken nũbers.

I Demaunde how much the $\frac{5}{8}$ of 20. ſhillings are worth, or what are yͤ $\frac{5}{8}$ of 20. ſhillings. *Anſwere:* you muſt multiplye $\frac{5}{8}$ by $\frac{20}{1}$ and yͤ product wil be $\frac{100}{8}$, therefore diuide 100. by 8. and therof commeth 12. $\frac{1}{2}$, which is to ſaye, 12. s. 6. d. and ſo much are yͤ $\frac{5}{8}$ of 20. ſhillings worth. I.

2. I demaunde what the $\frac{3}{4}$ of $\frac{5}{6}$ of a pounde of money are worth, that is to ſay of 20. s. *Aunſ.* multiplye $\frac{3}{4}$ by $\frac{5}{6}$. And thereof commeth $\frac{5}{8}$. Then take

the $\frac{5}{8}$ of 20. ſhil. as in the laſt queſtion going before, and you ſhall finde 12.s 6.pence, and ſo much are the $\frac{3}{4}$ of $\frac{5}{6}$ of 20.s. worthe.

3. I demaunde what the $\frac{2}{3}$ of 8. d. $\frac{1}{2}$ are worth. *Aunſwere:* multiply 8.$\frac{1}{2}$ by $\frac{2}{3}$ or elſe $\frac{2}{3}$ by 8.$\frac{1}{2}$, which is all one, and you ſhall fynde $\frac{34}{6}$. Then diuide 34. by 6. and your quotient wyll be fyue pence $\frac{2}{3}$, and ſo muche are the $\frac{2}{3}$ of 8. pence $\frac{1}{2}$ worth.

4. What are the $\frac{3}{4}$ of 14. pence $\frac{3}{5}$. *Aunſwere*: multiplie 14 $\frac{3}{5}$ by $\frac{3}{4}$, and thereof commeth $\frac{219}{20}$. Therefore diuide 219. by 20. and your quotient wil be ten pence $\frac{19}{20}$, and ſo much are the $\frac{3}{4}$ of 14. $\frac{3}{5}$.

5. How many quarters or fourthe partes are contayned in 7. $\frac{2}{3}$. *Aunſ.* multiply 7. $\frac{2}{3}$ by $\frac{4}{1}$ (bicauſe one whole contayneth 4. quarters) and thereof commeth 30. $\frac{2}{3}$, and ſo many quarters are in the 7. $\frac{2}{3}$, that is to ſay 30. quarters, and $\frac{2}{3}$ of a quarter.

6. Howe many thirdes are in $\frac{3}{4}$

and $\frac{1}{2}$, that is to ſaye in 3. quarters, and $\frac{1}{2}$ of one quarter, which are $\frac{7}{8}$ by the fifte reduction. *Aunſwere*: multiplie $\frac{7}{8}$ by $\frac{3}{1}$ (for bicauſe that in 1 whole are conteined 3. thirdes) and thereof will come $\frac{2}{3}$ and $\frac{5}{8}$ of a thirde, and ſo many thirdes are in $\frac{3}{4}$ and $\frac{1}{2}$ or in $\frac{7}{8}$, which is all one.

¶ Queſtions done by diuiſion in broken number.

1. What number is that, which being diuided by 17. the quotient wil be 13. *Aunſwere*: multiplye 17. by 13. And thereof commeth 221. whiche is the number that you ſeeke.

2. What number is that, which being diuided by $\frac{3}{4}$ the quotiēt wil be 21. *Aunſwere*, multiply $\frac{21}{1}$ by $\frac{3}{4}$ & thereof commeth $\frac{63}{4}$. Then diuide 63. by 4. and thereof commeth 15. $\frac{3}{4}$, which is the number that you ſeeke.

3. What number is that, whych being diuided by $\frac{1}{8}$, the quotient

wilbe $\frac{2}{3}$. *Aunſwere:* multiplye $\frac{2}{3}$ by $\frac{1}{3}$ & thereof commeth $\frac{2}{24}$ which being abbreuiated are $\frac{1}{12}$ for yͤ number which you require.

4. What number is that, whiche being diuided by $\frac{4}{5}$ the quotient will be 16. $\frac{2}{3}$: *Aunſwere:* multiply 16. $\frac{2}{3}$, by $\frac{4}{5}$, and thereof commeth $\frac{200}{15}$. Therefore diuide 200. by 15. and thereof commeth 13. $\frac{1}{3}$ which is the number that you deſire to finde.

5. What number is that, which being diuided by 13 $\frac{1}{3}$, the quotient will be 20. *Aunſwere:* multiplie $\frac{20}{1}$ by 13 $\frac{1}{3}$, and therof commeth $\frac{800}{3}$, then diuide 800. by 3. and thereof commeth 266. $\frac{2}{3}$, for the number, which you ſeke.

6. What number is that, which if it be diuided, by 12. $\frac{1}{2}$ the quotient will be $\frac{7}{8}$ *Aunſwere:* multiplie by 12 $\frac{1}{2}$ and therof commeth $\frac{175}{16}$, then diuide 175 by 16. and thereof commeth 10. $\frac{15}{16}$, for the nũber which you deſyre.

¶ Other

¶ Other neceſſarye queſtions done by Diuiſion in broken number.

I Demaunde what part 30. is of 70. *Aunſwere:* diuide 30. by 70. which you can not, for they are $\frac{30}{70}$, but abbreuiate them & they are $\frac{3}{7}$. Thus 30. are the $\frac{3}{7}$ of 70. 1.

2. I demaunde what parte 10. is of 16$\frac{2}{3}$. *Aunſwere:* diuide $\frac{10}{1}$ by 16.$\frac{2}{3}$, and thereof commeth $\frac{30}{50}$ which being abbreuiated are $\frac{3}{5}$. And thus 10. is found to be $\frac{3}{5}$ of 16$\frac{2}{3}$.

3. More, what part is 25. of $\frac{5}{8}$. *Aunſ.* diuide $\frac{5}{8}$ by $\frac{25}{1}$, and thereof commeth $\frac{5}{200}$, which being abbreuiated is, $\frac{1}{40}$. And thus $\frac{5}{8}$ is but the $\frac{1}{40}$ of 25.

4. More, $\frac{5}{6}$ what part are they of $\frac{7}{8}$. *Aunſwere:* diuide $\frac{5}{6}$ by $\frac{7}{8}$, and you ſhal finde $\frac{40}{42}$ which abbreuiated are $\frac{20}{21}$.

5. More, $\frac{4}{5}$ what parte are they of 13. $\frac{1}{3}$. *Aunſwere:* diuide $\frac{4}{5}$ by 13. $\frac{1}{3}$ and you ſhall fynde $\frac{12}{200}$, which being all bre-

uiated are $\frac{3}{50}$. And thus $\frac{4}{1}$ are the $\frac{9}{50}$ of 13.$\frac{1}{3}$.

6. More 12.$\frac{1}{2}$ what part are they of 30. *Aunſwere*, diuide 12.$\frac{1}{2}$ by $\frac{30}{1}$, & you ſhal find $\frac{25}{60}$ which being abbreuiated are $\frac{5}{12}$ and thus 12.$\frac{1}{2}$, are the $\frac{5}{12}$ of 30.

7. More, 16 $\frac{2}{3}$ what parte are they of of 57 $\frac{1}{7}$. *Aunſwere*, diuide 16.$\frac{2}{3}$ by 57 $\frac{1}{7}$ and thereof commeth $\frac{350}{1200}$ which being abbreuiated are $\frac{7}{24}$, and thus 16.$\frac{2}{3}$ are the $\frac{7}{24}$ of 57.$\frac{1}{7}$.

8. More, $\frac{3}{4}$ and $\frac{2}{3}$ of $\frac{1}{4}$, or 3.quarters & $\frac{2}{3}$ of one quarter, what parte are they of 1. *Aunſwere*, reduce $\frac{5}{4}$ and the $\frac{2}{3}$ of $\frac{1}{4}$ into one broken by the firſt reductiō, and you ſhall finde $\frac{11}{12}$. And thus the $\frac{3}{4}$ and $\frac{2}{3}$ of $\frac{3}{4}$ are the $\frac{11}{12}$ of one whole.

9. More, of what number are 9. the $\frac{2}{3}$. *Aunſwere*, diuide 9. by $\frac{2}{3}$, & thereof commeth 13.$\frac{1}{2}$, which is the number whereof 9. are the $\frac{2}{3}$.

10. More of what number are $\frac{2}{5}$ the $\frac{3}{4}$. *Aunſwere*, diuide $\frac{2}{5}$ by $\frac{3}{4}$, and thereof commeth $\frac{8}{15}$ which is the number whereof $\frac{2}{3}$ are the $\frac{3}{4}$ of the ſame nūber.

11. More, of what number are 5. $\frac{3}{4}$ the $\frac{3}{7}$. *Aunſwere:* diuide 5. $\frac{3}{4}$ by $\frac{3}{7}$, and you ſhall fynde 13. $\frac{5}{12}$ which is the nūber whereof 5. $\frac{3}{4}$ are the $\frac{3}{7}$.

12. More, 9 $\frac{2}{3}$ what part are they of 33. $\frac{1}{2}$. *Aunſwere:* diuide 9 $\frac{2}{3}$ by 33. $\frac{1}{2}$. And thereof commeth $\frac{58}{201}$: and thus 9. $\frac{2}{3}$ are the $\frac{58}{201}$ of 33. $\frac{1}{2}$ as appeareth.

The thyrde parte

treateth of certaine briefe rules, called rules of practiſe, with diuers neceſſarie queſtions profitable for Marchaunts.

The firſt Chapter.

SOme ther be, which doe call theſe rules of practiſe briefe rules, for that by them many queſtions may be done wyth quicker expedition, than by the rule of three. There be others which call them the ſmall multiplication, for bicauſe that the product, is alwaies leſſe in quantitie, than the number whiche is to bee multiplied. This practiſe commeth not in vſe, but onely amonge ſmall kindes of numbers, whiche haue ouer them, other numbers that are greater. And thys beyng well conſidered, is no other thyng but to conuert leſſer and particuler kindes of number, into greater, the which maye be done by the meanes of diuiſion, in taking the halfe, the thirde, the fourth, the fift, or ſuche other partes of the ſumme, which is to be multiplied, as the multiplier is part of hys greater kinde, and that which commeth thereof is worth as muche (not in quantitie, but in his owne forme) as if you did multiplye ſimplie the two ſummes, the one by the other: And for the better vnderſtanding of ſuche conuerſions, you muſt haue reſpect to one of theſe two conſiderations. The firſt is, whē one woulde demaunde this queſtion. At 6.d. the yarde of Cotton, what are 18. yardes worth by the price? It is manifeſt that they are worth 18. peeces of 6. pence the peece, or 18. half ſhillings, which muſt be turned into ſhillings, in taking yͤ halfe of 18.s. & they make 9.s. Or otherwiſe you muſt cōſider, that at 1.s. the yarde, the 18. yardes are worth 18.s. wherefore at 6.d. they ſhall be but halfe ſo much, for 6.d. is but the $\frac{1}{2}$ of 1.s. Therefore you muſt take the $\frac{1}{2}$ of 18. and they make 9.s. which are worthe as much as 108.d. that is to ſay, as 18. times 6. pence.

2. Firſt, if you will multiplie anye number after thys maner by pence whereof the number of yͤ ſame pẽce, doe not extende vnto 12. and therof to bring ſhillings into the product: you muſt know the certaine partes of 12. which are theſe: that is to ſay, 6.4.3. 2. and 1. For 6. is the $\frac{1}{2}$ of 12. and 4. is the $\frac{1}{3}$ of 12: 3. is yͤ $\frac{1}{4}$: 2. is the $\frac{1}{6}$: and 1, is the $\frac{1}{12}$. Then for 6.d. which is the halfe of 1. ſhilling, you muſt take the $\frac{1}{2}$ of al the number which is to be multiplyed. And that which commeth thereof, ſhal be ſhillings, if there doe remaine 1. it is 6. pence.

For foure pence you muſte take the $\frac{1}{2}$ of all the number that is to bee multiplyed: and if anye vnities doe remaine, they ſhall bee thyrdes of a ſhilling, euery one being in value 4. pence.

For 3. pence you muſt take the $\frac{1}{4}$ of al the ſumme; if anye vnities doe remaine, they ſhall bee fourthes of a ſhilling, euery one being worth thre pence.

For 2. pence you muſt take the $\frac{1}{6}$ of all the ſumme, and if any vnities doe remaine, they ſhall be ſixte partes of a ſhilling, being euerye one of them worth two pence.

For d. take the $\frac{1}{12}$ of the whole ſūme, if anye vnities remaine, they are 12. partes of a ſhilling, eche of them being in value 1.d. as by theſe examples following doth plainely appere.

j.

At 6. *Pence the yarde.*
What 59. *yardes.*

29. *ſhill.* 6. *Pence.*

ij.

At 4. *Pence.*
What 82.

27. *ſhill.* 4. *Pence.*

iij.

At 3. *Pence.*
What 927.

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24. *ſhill.* 3. *Pence.*

iiij.

At 2. *Pence.*
What 346.

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57. *ſhil.* 8. *Pence.*

v.

At 1. *Pence.*
What 343.

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28. *ſhil.* 7. *Pence.*

Here you may ſee in the fyrſt example that 59.yardes,at 6.pence yͤ yarde is worth.29.ſhil.6.d.in taking the $\frac{1}{2}$ of 59. And in the ſeconde example, yͤ 82. yardes at 4.pẽce the yarde,is worth, 27.s. 4.d.in taking the $\frac{1}{3}$ of 82.

Likewiſe, in the thyrde example, 97. yardes, at three pence the yarde, bringeth 24.ſhil. 3. pence, in taking the $\frac{1}{4}$ of 97. Alſo in the fourth example,346.yardes,at 2.pence the yarde, maketh 57. ſhillings eyght pence in taking the $\frac{1}{6}$ of 346. And fynally in yͤ fift example. 343. yardes, at 1.d. the yarde, amount to 28. ſhil.7.d. in taking the $\frac{1}{12}$ of 343. And ſo is to bee done of all ſuch lyke, when the number of the pence, is any of the certaine partes of 12.

But if the number of the pence be not a certayne parte of 12. you muſte reduce them into ſome certayne partes of 12. and after the foreſayd maner you ſhal make two or three productes as neede ſhal require, and adde them togyther into one ſumme as 5.d. may be reduced into 4.& 1. or els into 3.& 2: wherfore if you wil work by 4.& by 1: you muſt for 4.d. take fyrſt the $\frac{1}{3}$. of yͤ number, that is to be multiplied, and for 1.d. take the $\frac{2}{12}$, or rather for 1.d. ye may take the $\frac{1}{4}$ of the producte which did come of the 4.d. bycauſe that 1.d. is the $\frac{1}{4}$ of 4.d. But if you wyl worke by 3, and 2, you ſhal take for 3.d. the $\frac{1}{4}$. of the number which is to bee multiplied: and likewyſe for 2.d. the $\frac{1}{6}$ of the ſame number, adding togyther both

the

the productes. The totall ſumme of thoſe two numbers ſhall be the ſolution to the queſtion. And in like maner is to be done of all other. As by theſe formes folowing may appeare.

j.

At 5. d. the yarde.
What 49. yardes?

16. *ſhil.* 4. *d.*
4. *ſhil.* 1.

20. *ſhil.* 5. *d.*

ij.

At 7. d.
What 54?

18. *ſhil.* 0
13. *ſhil.* 6

31. *ſhil.* 6. *d.*

iij.

At 8. d.
What 40?

13. *ſhil.* 4
13. *ſhil.* 4

26. *ſhil.* 8. *d.*

iiij.

At	9. *d.*	
What	73?	
	36. *ſhil.*	6
	18. *ſhil.*	3
	54. *ſhil.*	9. *d.*

v.

At	10. *d.*	
What	32?	
	16. *ſhil.*	0
	10. *ſhil.*	8
	26. *ſhil.*	8. *d.*

vj.

At	11. *d.*	
What	27?	
	9. *ſhil.*	0
	9. *ſhil.*	0
	6. *ſhil.*	9
	24. *ſhil.*	9. *d.*

Here in this ſame firſt exaumple where it is demaunded (at 5.pence ẏ yard) how much are nine and fourty yardes woꝛth? Fyꝛſt foꝛ foure pence, I take yͤ ⅓ of 49.s.and thereof cõmeth 16.s.4.d.thẽ for 1.d.I take the ¼ of the ſame product,that is to ſay,of 16.s.4.d. and that bringeth.4. ſhil.1.d. theſe two ſũmes added togither, do make 20.s.5.d.And ſo much are the 49.yardes worth at 5.d.the yard.

For 7.d. take the ⅓ and the ¼ of the whole ſumme which is to be multiplied,and adde them togither,that is to ſay,for 4.d.the ⅓ and for 3.d. the ¼: bycauſe 4.d. is the ⅓ of 12.d. and 3.d.is the ¼ as in the ſecond example before doth appeare: Where the queſtiõ is thus,at 7.d.yͤ yard what are 54. yardes worth? Fyrſt for 4.d. I take the ⅓ of 54:and they make 18.s. Likewyſe for 3.d.I take the ¼ of 54. and they are 13.s.6.d.Then I adde 18.s.and 13.s.6.d.togither,ſo both amount to 31.s.6.d and ſo much are the 54.yardes worth at 5.d.the yarde.

Otherwyſe for 7.d. take firſt the ½, of the whole ſũme for 6.d. Then for 1.d.take the ⅙ of theſame product,and adde them togither, ſo ſhall you haue the lyke ſumme as before.

For eight pence you muſt firſt take $\frac{1}{3}$ of the whole ſume for 4. pence, and another $\frac{1}{3}$ for other 4.d. and adde thẽ togyther as in the example doth euidently appeare. Where the queſtion is thus, at 8.d. the yarde, what are 40 yardes worth? Fyrſte for 4.d. I take the $\frac{1}{3}$ of 40. which is 13.s.4.d. Againe, I take another $\frac{1}{3}$ for the other 4 pence whiche is alſo 13. ſhillings & 4. pence. Theſe two ſummes being added togither, do make 26. ſhillings 8. pence, and ſo much are the 40. yards worth at 8. pence the yard as in the third example aboueſayd doth appeare.

Otherwayes, for eyght pence you mai take firſt the $\frac{1}{2}$ of the whole ſume for 6.d. Thẽ for 2.d. you ſhal take the $\frac{1}{3}$ of the product, which did come of the ſayd $\frac{1}{2}$, and adde them togither, ſo ſhal you haue likewiſe the ſolution to the queſtion. As in the ſame third exãple of 40. yardes, I take firſt the $\frac{1}{2}$ of 40.

for 6.d.and thereof commeth 20.ſhil. then for 2.d. I take $\frac{1}{3}$ of the ſaide product,that is to ſay of 20.s.which bringeth 6.s.8.d.theſe two ſummes (20.s and 6.s. 8.d.) I adde togither & they make 26.s. 8.d.as before.

For 9.d.you muſt take the $\frac{1}{2}$ & the $\frac{1}{4}$ of the whole ſūme, and adde them togither: or elſe for 6.d. take fyrſt $\frac{1}{2}$ of the whole ſumme,then for 3.d. take yͤ $\frac{1}{2}$ of the ſame product,bicauſe 3.d.is yͤ halfe of 6.d. And 6.d. added with 3.d. bringeth 9.d. as by the fourth example,where it is demaunded after this ſort: at 9.d. the yarde, what are 73. yardes worthe. Firſt for 6.d. I take the $\frac{1}{2}$ of 73. and therof commeth 36.s. 6.d.then for 3.d.I take $\frac{1}{2}$ of yͤ ſame 36. ſhil. 6.d. which is 18.s.3.d. theſe two ſummes doe I adde togither, & they make 54.ſhil.9.d.as in yͤ ſaide fourth example is euident.

For 10.d.take firſt the $\frac{1}{2}$, then yͤ $\frac{1}{3}$ of the whole ſūme, & adde thē together

For 11,d.take fyrſt $\frac{1}{2}$ for 4.pence,ſecondely, another $\frac{1}{3}$ for other 4.d. and thirdely $\frac{1}{4}$ for 3.d. of all yͤ whole ſumme: and adde them togither.

Or elſe for 11.d. take firſt the $\frac{1}{2}$ then the $\frac{1}{3}$ of the whole ſumme, and finallye the $\frac{1}{4}$ of the laſte product, adding them togither.

3. Lykewiſe by the ſame reaſon, when you wil multiply (by ſhillings) anye number that is vnder xx.s. you ſhall haue in the product poundes, if you knowe the certaine partes of 20: which are theſe: 10.5.4.2.& 1. For 10. is the $\frac{1}{2}$ of 20. 5 is the $\frac{1}{4}$ part: 4 is the $\frac{1}{5}$: 2. is the $\frac{1}{10}$: and 1. is the $\frac{1}{20}$.

Then for 10.s. which is the $\frac{1}{2}$ of a pounde: you muſte take the $\frac{1}{2}$ of the number, which is to bee multiplied, and you ſhall haue poundes in yͤ product. If there doe remaine 1, it ſhalbe worth ten ſhillings.

For 5. ſhillinges you muſte take the $\frac{1}{4}$ of the number whiche is to bee multiplied, & if there do remaine any vnities, they ſhall be foure partes of a poũd, euery one being in value 5.s.

For 4.s.you muſt take the $\frac{1}{5}$ of the number which is to bee multiplied. And if there do remaine any vnities, they ſhal be fift parts of a pound euery one being worth four ſhillings.

At 10. *ſhillings the Peece.*
What 75. *Peeces?*
37. *li.* 10. *ſhil.*

At 5. *ſhil.*
What 89.
22. *li.* 5. *ſhil.*

At 4. *ſhil.*
What 93.
18. *li.* 12. *ſhil.*

For 2.ſhillings you muſt take the $\frac{1}{10}$ of the nũber that is to be multiplied. Wherefore,if you wyll take the $\frac{1}{10}$ of any number: you muſte ſeperate the laſt figure of the ſame number which is nereſt your ryghte hande, from all the other fygures. For all the other figures which doe remayne towarde your lefte hande, from the ſame fygure, which is ſeperated, ſhall bee the ſayde $\frac{1}{10}$ of a pounde: and that ſeperated fygure, towarde your right hand ſhall be ſo many peeces of 2. ſhillings the peece: the which fygure muſte be doubled, to make therof ſhillings, as by theſe examples appeareth.

At 2. *ſhil.*
What 9|8.
9. *li* 16. *ſhil.*

At 2. *ſhil.*
What 40|3.
40. *li.* 6 *ſhil.*

Herevpon dependeth another exact way for to multiply by ſhillings (if yͤ number of ſhillings be euē) which is thus: you ſhal take $\frac{1}{2}$ the nūber of the ſame ſhillings, and conuert them into peeces of 2. ſhillings. Then by the number of this halfe, you muſt firſte multiply the laſt figure toward your right hande, of the nūber which is to be multiplied: And if ther be any tennes in theſame product, thoſe muſt ye reſerue in your minde: But if (wyth theſame or els without theſame) you doe finde any diget number, theſame diget number ſhall you double, & put it in the place of ſhillings: Thē muſte you proceede to the multiplication of the other figures, adding vnto yͤ product the tennes which you before reſerued: and therof ſhal come poundes.

Now, for your better vnderſtanding of this which hath bene ſaid and by the way of example, I wil propone vnto you this queſtion.

At 8. ſhillings the groſſe, what are 97. groſſe worth after the rate?

Firſte in this example I take halfe the number of Shillinges, as before is taught, that is to ſay of eighte ſhillings, which is foure ſhillinges: this 4. ſhil. I put apart, behinde a crooked line,

line righte againſte 97. towardes the left hand, as here you may ſee and as here after apereth by diuers exãples.

At 8. ſhil. the Groſſe.

4) *What* 9|7

38. *li.* 16. *ſhil.*

At 6. ſhil.

3) *What* 9|9

29. *li.* 14. *ſhil.*

At 12. ſhil.

9) *What* 34|5

207. *li.* 0 *ſhil.*

At 14. ſhil.

7) *What* 21|0

127. *li.* 0. *ſhil.*

Now in the firſt exaumple, where it is demaũded, at 8. s. the groſſe, what are 97 groſſe? Firſt the ½ of 8. s. which is 4. s. being ſet apart behind the croked line, as before is ſayd: thẽ I multiplye yͤ 97 by 4. ſaying firſt, 4. times 7. is 28. I double yͤ diget nũber 8. and that maketh 16, the which 16, I do put vnder the line, in the place of ſhilligs & I kepe ỹ tennes in my mind, which here are 2. For 20. are two times ten: Then ſecondly, I multiply 9, by the ſayd 4, and thereof cõmeth 36: whervnto I adde the 2, tennes, which before I dyd reſerue, and they make 38. Therefore I put 38, vnder the lyne in the place of poundes, and the whole ſumme wil be 38.li.16.s. Thus much are the 97. groſſe worth, at eight ſhillings the groſſe: the like is to be done of all other. As of 12. ſhillings in multiplying by 6. Likewiſe of 6. ſhillings if you multiply by 3, alſo of 14. if you multiply by 7. And ſo of all euen nũbers after the ſame manner.

For 1. Shilling you muſt take the $\frac{1}{2}$ of the $\frac{1}{10}$ parte of any number that is to be multiplied. And if any thyng do remayne, they are ſhil. Thus by this manner ſhil.

At 1. *ſhil.*
What 35|0
17. *li.* 10. *ſhil.*

are conuerted into poundes; for it is euen lyke, as if you did diuide thē by 20.s. as by this exāple in the margent doth appeare. Wher it is demaūded at 1.s. the yard, the pæce, or any other thing, what are 350. worth?

Firſt I ſeperate the laſte fygure of 350. nexte to my ryght hand, which is the 0 wyth a line betwæne it and the figure 5. Then I make a line vnder the 35|0, and I take the ½ of 35, after this maner: ſaying the ½ of 3. is 1. and 1. remayneth, which remayn ſignifieth 10. in that ſecond place. Then I put 1. vnder the line agaynſt 3, & I procæde to the reſt, ſaying: the halfe of 15, is 7. (which 15. came of the 1. that remayned, and of the 5. in ẏ firſt place) I put 7. vnder the line right agaynſt 5, and they make 17.li. The 1, which did laſt remayne, is 10.s. Therfore I put 10.s aparte vnder the line, and the whole ſumme is 17.li.10.s. ſo muche are 350. worth at 1.s. the pæce.

But when the number of ſhillings

is not ſome certayne parte of 20. ſhil. you muſte then conuert the ſame nūber of ſhillings, into the certayn partes of 20. and make two or thrée products, as nede ſhal require, the which muſte bée added togyther after thys maner following.

For 3. ſhillings you muſt firſte take for 2. ſhil. the $\frac{1}{10}$ of the number that is to be multiplied, then for 1. ſhillig you muſt take the $\frac{1}{2}$ of the producte which did come of the ſame $\frac{1}{10}$ part: and adde thoſe two ſūmes togither, as appeareth by this example following.

At 3. s. the péece of any thing, what ſhall 684 péeces coſte mée after the rate. Firſte, for 2 ſhillings I take the $\frac{1}{10}$ of 684, which is 68: in ſeperating the laſte figur 4, which I muſt double, and they be 8. I ſet eyghte ſhillings aparte from the place of poundes, and then I haue 68. poūdes 8. s. for the $\frac{1}{10}$ parte, that is to ſay, for

At 3. ſhil.
What 68|4?
68. li. 0. ſh
34. 4.
102. li. 12. ſh

for the 2.s.ſecondlye,for 1.ſhil.I take the $\frac{1}{2}$ of the product,that is to ſaye: of 68.li.8.s. which is 34.li. 4.s. and I put the ſame vnder the 68.li. 8.ſhil. Then finally,I adde thoſe two ſummes together,yͤ is to ſaye, 68.li. 8.s. and 34.li. 4.ſhil, ſo they make 102.li. 12.s.and ſo much are the 684. pœces worth at 3.ſhillings yͤ peece, as may appere in the margent.

For 6.ſhil.take $\frac{3}{10}$ of the number which is to be multiplied: that is to ſay,firſt $\frac{1}{10}$,then double the product of the ſame $\frac{1}{10}$ and adde them togither. Or otherwiſe for 4.s.take fyrſt yͤ $\frac{1}{5}$ of yͤ nūber that is to be multiplied, thē take the $\frac{1}{2}$ of the product which is for two.s.and adde them togither.

Or elſe take for 5.ſhil. the $\frac{1}{4}$ of the whole ſumme,then for 1.ſhil.the $\frac{1}{5}$ of the product and adde them togither.

Likewyſe for 7.ſhil.take fyrſt for 5. ſhil.the $\frac{1}{4}$ then for 2.ſhillings take the $\frac{1}{10}$ of the number which is to be multiplied,and adde them togither.

For eyght ſhillings take the $\frac{2}{5}$ at two ſundry tymes, that is to ſay, firſt $\frac{1}{5}$ for 4. ſhil. and then as much more for other 4. ſhil. and adde them togyther.

For 9. ſhil. take firſt the $\frac{1}{4}$ and lykewiſe the $\frac{1}{5}$ of the number that is to be multiplied, and adde them togither.

For 11. ſhil. take firſt $\frac{1}{2}$ for 10. s. Thē for 1. ſhil. take the $\frac{1}{10}$ of the producte, & adde them togither.

For 12. ſhil. take firſt the $\frac{1}{2}$ for 10. ſhil then for 2. s. take the $\frac{1}{5}$ part of the product, and adde them togither.

For 13. ſhil. take the $\frac{1}{4}$ then the $\frac{1}{5}$, & agayne another $\frac{1}{5}$ of the nūber which is to be multiplied. And adde the productes togither, that is to ſay: fyrſte for 5. ſhil. take the $\frac{1}{4}$, then for 4. ſhil. take the $\frac{1}{5}$. And agayne, another $\frac{1}{5}$ for the other 4. ſhil. and aſſēble the three productes, the like is to be done in al others, when the price of the thing which is valued, is onely of ſhillings. And as by theſe examples following doth playnly appeare.

At 6.*ſhil.*
Whas 67.
13. .8
6. .14
20.*li.* 2.*ſhil.*

At 7.*ſhil.*
What 347.
86. .15
34. .14
121. *li.* 9.*ſhil.*

At 8. *ſhil.*
What 540.
108. .0
108. .0
216. *li.* 0.*ſhil.*

At 9.*ſhil.*
What 230.
57. .10
46. .00
103. *li.* 10.*ſhil.*

At 11.*ſhil.*
What 159.
79. .10
7. .19
87.*li* 9.*ſhil.*

At 12. *ſhil.*
What 349.

174. .10
34. .18

209. *li* 8. *ſhil.*

At 13. *ſhil.*
What 267.

66. .15
53. .8
53. .8

173. *li.* 11. *ſhil.*

4. Likewiſe in multiplying by pence you ſhal haue (at the firſt inſtãt) poũdes in the product, in caſe you knowe the certayne partes of the $\frac{1}{10}$ of a poũd or of 24. pence, which are theſe 12, 8, 6, 4, 3, and 2. For 12, is the $\frac{1}{2}$ of 24: 8. is ẏ $\frac{1}{3}$: 6 is the $\frac{1}{4}$: 4 is the $\frac{1}{6}$: 3 is the $\frac{1}{8}$: and 2. the $\frac{1}{12}$: but for 12. d. which is 1. ſhil. we haue before made mencion thereof.

For 8. d. you muſte take the $\frac{1}{3}$ of the $\frac{1}{10}$ and the reſt which are the pæces of 8. d. muſt be doubled to make of them pæces of 4. d. And of the ſame number being doubled, you muſt take the

$\frac{1}{2}$ which

$\frac{1}{3}$ which wil be ſhillinges, & if there do yet remayn any thing, they are thirds of a ſhilling beeing in value 4. pence the peece.

For 6.d. take the $\frac{1}{4}$ of the $\frac{1}{10}$, and of that which remayneth you muſt take the $\frac{1}{2}$ which ſhall be ſhillings, if there do yet remayne 1, it ſhall bee in value 6.pence.

For 4.d. you muſt take the $\frac{1}{6}$ of the $\frac{1}{10}$ and of that which reſteth, take the $\frac{1}{3}$ to make ther of ſhillings, if any thing do yet remayne, they are thirdes of a ſhilling, being in value 4.d. the pece.

For 3.d. take the $\frac{1}{8}$ of the $\frac{1}{10}$, and of that which remayneth, take the $\frac{1}{4}$, to make of them ſhillings: if any thing do yet remaine, they are fourthes of a ſhilling, euery one of them beeing worth 3.d.

For 2.d. take the $\frac{1}{12}$ of the $\frac{1}{10}$: and of that which reſteth take yͤ $\frac{1}{6}$ the which are ſhillings, if there do ſtill remayne any thing, they ſhall be ſixt parts of a ſhilling, euery one being in value 2.d

For 1.d. it is not poſſible with eaſe, to bring of pence, poūds (into the product) vpon the total ſumme: But firſt you muſt bring thē into ſhillings by yͤ order of the ſecōd rule of this chapter, and then afterward you ſhal conuert thē into poūds, if nede ſo require. As by this exāple following may apeare.

At 8. *d.*
What 59|5.
19. *li.* 17. *ſhil.* 4. *d.*

At 6. *d.*
What 67|8.
16. *li.* 19. *ſhil.*

At 4. *d.*
What 93|4.
15. *li.* 11. *ſhil.* 4. *d.*

At 3. *d.*
What 57|1.
7. *li.* 2. *ſhil.* 9. *d.*

At 2. *d*
What 36|4.
3. *li.* 0. *ſhil.* 8. *d.*

At 1. d.
What 66|5.

5·5. 00.ſhil. 4.d.

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2. li.16.ſhillings. 4.d.

But if the number of pence, be not a certayne parte of 24. pence. Then muſt you bring them into the certain partes of 24. and make therof diuers productes, which muſt be added togither, as ſhall hereafter appeare.

For 5. pence you ſhall firſte take for 3. pence, then for 2. pence, and adde them togither, according to the inſtruction of the laſt rule. Or elſe firſte take for 4. pence, and then for 1. d.

For 7. d. firſte take for 4. d. then for 3. d. and adde them togither:

For 9. d. fyrſte take for 6. d. then for 3. d. adding them togither.

For 10. d. fyrſte take for 6. d. then for 4. d. and adde them togither.

For 11. d. take firſt for 8. d. then for 3. d. & adde them togither: as by theſe examples following doth appeare.

At 5. d

What 92|7.

11. .11. .9

7. .14. .6

19. li. 6. ſhil. 3. d.

At 7. d.

What 51|2.

8. .10. .8

6. .8. .0

14. li. 18. ſhil. 8. d.

At 9. d.

What 54|6.

13. .13. .0

6. .16. .6

20. li. 9. ſhil. 6. d.

At 10. d.

What 27|3.

6. .16. .6

4. .11. .0

11. li. 7. ſhil. 6. d.

At 11. d.

What 26|4.

8. .16. .0

3. .6. .0

12. li. 2. ſhil. 0. d.

5. If you wil multiply any number by ſhil.and pence,being both togither you muſt take firſt for the ſhil. according to yͤ inſtructiō of the rule of this firſt chapter,then take for yͤ pence after the order of the fourth rule before mencioned:but if ther be any certayn partes of 1.li. cōtayning both ſhil.and pence,thē for ſuch parts you ſhal take the like part of the number that is to be multiplied,as the nūber is part of 1.li.the which certain parts are theſe, 6.s.8.d:3.s.4.d:2.s.6.d:& 1.s.8,d. For 6.s.8.d.is the $\frac{1}{3}$ of a li.3.s.4.d. is yͤ $\frac{1}{6}$ of a li.2.s.6.d.is the $\frac{1}{8}$: & 1.s.8.d.is the $\frac{1}{12}$. then for 6.s.8.d.you muſt take the $\frac{1}{3}$ of the nūber that is to bee multiplied: & if ani thing do remain,they are thirds of a li.euery one being worth 6.s.8.d

For 3.s.4.d.you muſt take yͤ $\frac{1}{6}$ if ani thing do remain,they are ſixt parts of a li. euery one being in value 3.s.4.d.

For 2.s.6.d.you muſt take the $\frac{1}{8}$: if any thing be remaining they ar eight parts of a li.ech one beīg worth 2.s.6.

For 1.ſhil.8.d.you ſhal take the $\frac{1}{12}$ if there do any thing remaine, they are twelfth partes of a pounde euery one being valued at 1.ſhil.8.d.

At 6.*ſhil.* 8. *d*
What 647.

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215. *li.* 13.*ſhil.* 4. *d.*

At 3.*ſhil.* 4. *d*
What 220.

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36. *li.* 13.*ſhil.* 4. *d*

At 2.*ſhil.* 6. *d*
What 47.

---

5. *li.* 17. *ſhil.* 6. *d*

At 1. *ſhil.* 8. *d*
What 400.

---

33. *li.* 6. *ſhil.* 8. *d*

6.Hære ſhall you accuſtome youre ſelfe,to multiply by all ſortes of ſummes,being compoũd of ſhillings,and pence,which mai come to practiſe.As thus,for 1.s.1.d.for 1.s.2.d.1.s.3.d.for 1.s.4d.Likewiſe for 2.s.1.d.2.s.2.d.2.s.3.d.2.s.4.d. And ſo of all other: conſidering moreouer, many ſubtile abbreuiations,which happen oftẽtimes that are eaſy to be cõceyued. As thus at 11.s.3.d.after that I haue takẽ firſt the $\frac{1}{2}$ for 10.s. Then for 1.s.3.d. I take the $\frac{1}{8}$ of the product, bycauſe 1.s.3.d.is the $\frac{1}{8}$ of 10.s.in taking the ſayd $\frac{1}{8}$ of the product. And by this meanes, whẽ ye haue taken one product, ye may oftẽtimes vpõ yͤ ſame, take another more briefly thã vpõ yͤ ſũme yͭ is to be multiplied, which thing you muſt foreſee.

At	11.*ſhil.*	3.*d.*	
What	53.		
	26.	.10.	.0
	3.	.6.	.3
	29.*li.*	16.*ſhil.*	3.*d.*

At	6.*ſhil.*	3. *d.*	
What	58.		
	14.	10.	.
	3.	12.	6.
	18.*li.*	2.	6.*d.*

At	12.	8.*d.*	
What	64.		
	32.	0:	.
	6:	8.	.
	2.	2.	8.
	40.*li.*10.*ſhil.*8.*d.*		

7. But if you wil multiply, by poūds, ſhillings and pence being altogither. Firſte you muſte wholy multiply by poundes. Then take for the ſhillings and pence, as in the fifte rule of thys chapter is plainly declared. And as by theſe examples folowing may apere.

At 3. li. 6. ſhil. 8. d.
What 49.

147. .0 .
16. .6 .8

163. li. 6. ſhil. 8. d.

At 5. li. 18. ſhil. 4. d.
What 543.

2715. .0. .
271. .10. .

135. .15. ,
90. .10. .0

3212. li. 15. ſhil. 0. d.

At 2. li. 7. ſhil. 4. d.
What 927.

1854. .0. .
185. .8. .
154. .10. .

2193. li 18. ſhil. 0. d.

8. So theſe rules do ſerue both to bye and ſel, at ſuch a price the elle, the yard, the pece, the poūd waight, or any other thing: how much ſuch a thīg Lykewyſe they are very neceſſary to cōuert al peces of gold and ſyluer into poundes: for I may as wel ſay, at 4.ſhil.8.d. the French crowne, what are 135. crownes worth?

9. When anye one of the ſummes (which is to be multiplied) is cōpoūd of many denominatiōs: & the other is of one figure alone: thē ſhal ye multiplye all the Denominations of the other ſumme, by the ſame one figure begining firſt wyth that ſūme which is leaſt in value towardes your right hande, and bring the product of thoſe pence into ſhillings, and the producte of the ſhillings into poūds, as by this example doth appeare

At 3.*li.* 9.*ſhil.* 8. *d.*
What 7.

24. *li.* 7. *ſhil.* 8. *d.*

10. But (if in any of yͤ nūbers which are to be multiplied) ther be with it a broken number, you muſt (according to his denominator) take one or many partes of the other nūber, as neede doth require: and ſet the nūber which cōmeth thereof, vnder the productes, adding theſame togither. As thus: At 5. li. 7. s. 8. d. the groſſe, what ſhall. 34. groſſe ½ coſt? Firſt you ſhall multiply 5. li. 7. ſh. 8. d. by 34. groſſe, ſaying 5. tymes 34. doe make 170. li. then for 6. ſh 8. d. take the ⅓ of 34 which is 11. li. 6. ſhil 8. d. Thirdely, for 1 ſh. take 34. ſhillings, which is 1. li. 14. ſhillings 0.

At 5. *li.* 7. *ſh.* 8. *d*
What 34 ½.
170. . 0
11. . 6 . . 8.
1. . 14 . . 0
2. . 13 . . 10
185. *li.* 14. *ſhil.* 6. *d*

Laſtly, for the ½ groſſe, you muſt take ½ of the 5. li. 7. s. 8. d. which is 2. li. 13. s. 10 And then adde them all togither, ſo you ſhall finde that the 34. groſſe ½ at 5. pound 7. ſhillings 8. pence is worth 185.

185.pound,14.ſhillings 6.pence,as apeareth in the margent.

And as in this laſt exaumple, you did take the half of the money,(which one groſſe was worth) for the $\frac{1}{2}$ groſſe Bycauſe that 1.groſſe beeing worth 5.pound 7.ſhillings 8.pēce, the $\frac{1}{2}$ groſſe muſte bee worth halfe ſo muche. So likewiſe,if you haue $\frac{1}{3}$ of a groſſe,or of any other thing,you muſte take the $\frac{1}{3}$ of the price,that one groſſe is worthe. Semblably,for the $\frac{1}{4}$ of any thing you ſhal take the $\frac{1}{4}$ of the price, alſo if you haue $\frac{2}{3}$, take the $\frac{2}{3}$ of the price that one is worth,and of all other fractions,as by theſe examples folowing doth appeare.

At	4.*li.*	6.*ſhil.*	8.*d.*
What	46.$\frac{1}{2}$.		
	184.	.0.	.0
	15.	.6.	.8
	2.	.3.	.4
	201.*li.*	10.	0.*d.*

At

At	8. *li.*	0. *ſhil.*	9. *d.*
What	54. $\frac{1}{3}$		
	432.	.0.	.0
	1.	.7.	.0
	0.	.13.	.6
	2.	.13.	.7
	43 .*li.*	14. *ſhil.*	1. *d.*

At	3. *li.*	16. *ſhil.*	8. *d.*
What	17. $\frac{3}{4}$		
	51.	.0.	.0
	8.	.10.	.0
	5.	.13.	.4
	.	.19.	.2
	68. *li.*	00. *ſhil.*	10. *d.*

11. If you will make the proofe of theſe rules aforeſayd, you muſt firſt abate the ſūme of money (which the fractiō of the multiplicatiō doth import) frō the totall ſūme. And diuide the reſt of the poūds of the ſayd total ſumme, by the whole multiplicand, the fraction only accepted. And if any thing do remain after the diuiſion is made, that remaine ſhal be multiplied by 20. and vnto the product of that multiplication,

on, you ſhall adde the ſhillings which remained of the reſt of the total ſūme Agayn, if any thing do remaine after the ſame diuiſion, you muſt multiply theſame by 12, & vnto the product adde the pence of the total ſumme that remayned, if any be left. And thus if ye haue truly wrought, you ſhal find again the higher ſūme of your queſtiō that is to ſay, the price that one groſſe or any other thing is worth, whereof you demaund.

Or otherwiſe reduce the remayne of the totall ſumme (the value of the moneye that the fraction is worthe, bæing fyrſte deducted) all into pence, in multiplying the pounds by 20, and the ſhillings by 12. adding thereunto, the ſhillings and pēce, which are ioyned wyth the remayne of the ſayd totall ſūme, if any ſuch be, then diuide thoſe pence by the foreſayde number that is to be multiplied, the fraction of the ſame number bæing alſo abated. So ſhall you finde the price that one peece, one Groſſe, or any other thing is valued at. As in the firſte example going before, where the totall ſumme is 201.pound 10.ſhillings, frõ the which I doe firſt abate the price of the half groſſe, which is 2.li.3.s.4.d, the reſt is 199.li.6.s.8.d. which beeing reduced into pens bringeth 47840.d. I diuide the ſame by 46. and thereof commeth 1040.pence. Then I diuide that 1040.pence by 12. and they bring 86.ſhillings 8.pence, that is to ſay, 4.li.6.ſhillings eyght pence, whiche is the price that one groſſe, or any other thing did coſt, as in that fyrſte example doth appeare.

12. The lyke is to be done of any manner of thinge that is ſolde by the hundred or by the Kyntall.

As thus: at 12.pound 7.ſhillings.6.d the 100.pounde wayghte: what ſhall 374.pound wayght coſt? You ſhall fyrſt multiply twelue pounde, ſeuen ſhillings, ſixe pence, by three: that is to ſaye, by three hundreth. Then for

50.li.

At.12.li.7.ſh.6.d
What 3|74.

37..2..6
6..3..9
2..9..6
0..9..10.$\frac{4}{5}$

46.li.5.ſh.7.d.$\frac{4}{5}$

50.li. waight, you ſhall take the $\frac{1}{2}$ of 12.li. 7.s. 6.d. bicauſe 50.li. is the $\frac{1}{2}$ of 100.li. Likewiſe for 20.pound waight, which is the $\frac{1}{5}$ of 100.li. take the $\frac{1}{5}$ of 12.li. 7.ſhil. 6.d. laſtly for 4.li. waight take the $\frac{1}{5}$ of the laſte product. This done, you muſte adde all theſe productes into one ſumme, which will make the ſumme of 64.li. 5.s. 7.d.$\frac{4}{5}$, as by this exāple aboue written doth appeare.

The profe is made by reducyng the totall ſumme into pence. And to diuide yͤ product by the number yͭ is to be multiplyed, yͭ to to ſaye by 374. likewiſe diuide yͤ quotient produced of that firſt diuiſyon by 12. ſo ſhal you finde againe the higher ſumme 12.li. 7.ſhil.6.d. which is the price of 100.li. waight, as before.

13. Alſo the like maye be done of

our vſuall waight here in Englande (which is 112.li. for euerye hundred pounde waight) in caſe you knowe the certaine parts of a hundred, that is to ſay, of 112.li. waight, which are theſe 56.li. 28.li. 14.li. 7.li, For 56.li. is the $\frac{1}{2}$ of 112. 28.li. is the $\frac{1}{4}$ of 112.li. 14.li. is the $\frac{1}{8}$, and 7.li. is the $\frac{1}{16}$.

Therfore, for 56.li. take the $\frac{1}{2}$ of the ſumme of money, that the 112. pound waight is worth.

For 28.li. take the $\frac{1}{4}$ of the ſumme of money that the 112.li. is worth.

For 14.li. take the $\frac{1}{8}$ of the ſumme that the C. is worth.

For 7.li. take the $\frac{1}{16}$ of the ſumme of money that the C. is worth.

As thus: at 3.li. 6.s. 8.d. the hundreth pounds waight, that is to ſaye, the 112.li. What ſhall 24.C. 3. quar. 21.li. coſt after the rate?

Fyrſt, you ſhall multiply 24. hundreth by 3. which is the 3.li. & thereof cōmeth 72.li. then for 6.s. 8.d. which is the $\frac{1}{3}$ of 20.s. you ſhal take yͤ $\frac{1}{3}$ of 24.

which

At 3.li.6.ſh.8 d.
What 26..3. 21. li.
72..0..0
8..0..0
1..13..4
..16..8
..8..4
..4..2
83.*li*.2.*ſh*.6.*d*.

which is 8.li.for 24. nobles maketh 8.li. afterwarde, for the 3. quarters of yͤ C.you ſhal firſt for yͤ 56. li. take the $\frac{1}{2}$ of 3.li. 6.s. 8.d.bicauſe 56.li is the $\frac{1}{2}$ of the C. & thereof cõmeth 1.li. 13.ſhil.4.d.then for 28.li. (which is the quar. of a C.) you ſhall take the $\frac{1}{4}$ of 3.li. 6.s. 8.d. or elſe the $\frac{1}{2}$ of the product, which came of 56.li.which is 16.s.8.d.likewiſe for 14.li.take the $\frac{1}{8}$ of 3.li.6.s. 8.d. which is 8.s. 4.d.or elſe the $\frac{1}{2}$ of the product of 28.li.which is al one: laſtly for 7.li take the $\frac{1}{16}$ of 3.li.6.s. 8.d. or elſe the $\frac{1}{2}$ of the product, that came of 14 li. and therof cõmeth 4.s.2.d. Then adde al theſe products togither: & the totall ſumme wil be 83.li.2.s.6.d. ſo muche are yͤ 24.c. 3.quar.21.li. waight worth after 3.li.6.s.8.d. yͤ C. as appereth in the margent.

The proofe hereof is made, lyke to the other proofes aforeſaide, ſauing that wher in thoſe proofes, you abate the price of the money, that the fraction was worthe, from the totall ſumme: here in thys example (and in ſuch other like) you muſte abate the price of money, that the odde waight amounteth vnto (ouer and aboue the iuſt hundrethes) from the ſaide totall ſumme, the reſt thereof ſhall you cõuert into pence, diuiding the product of yͤ multiplication by the iuſt nũber of the hundrethes, ſo ſhall you finde the pence yͤ one hundreth is worthe, which you ſhall bring into poundes by the order of diuiſion, & ſo all other.

¶ *The ſeconde Chapter treateth of the rule of three compounde, which are foure in number.*

There belongeth to the fyrſte & ſeconde partes of the rule of thre compounde alwaies fyue numbers: wherof (in the fyrſt part of the rule of thꝛæ compounde the ſeconde number and the fift, are alwaies of one ſemblaunce, and like denomination; whoſe rule is thus, multiply yͤ firſt nūber by the ſeconde, & that ſhalbe your diuiſoꝛ: then multiply e yͤ other thꝛæ nūbers the one by the other to be your diuidende. Exāple, of this firſt part: if 100.crowns in 12.monthes, do gaine 16.li. what will 60.crownes gaine in 8. monthes? *Aunſwere*, firſt multiplie 100.crownes by 12.monthes, & therof cōmeth 1200. foꝛ your diuiſoꝛ; then multiply 15.li. by 60.crownes, & by 8.monthes, & you ſhall haue 7200. diuide 7200. by 1200. & therof cōmeth 6.li. ſo many li. wyll 6.crownes gaine in 8.monthes: thys queſtiō may be done by yͤ double rule of 3. yͭ is to ſay bi yͤ rule of 3. at 2 times: yet this rule of 3 cōpoūd is moꝛe bꝛief

Crownes. monthes. poūds. crownes. monthes.

100. .12. .15. .60. .8.

*

72|00

12|00 (6.li.

2. In the ſeconde part of the rule of thre compound, the 3. number is like vnto the fift, wherof the rule is thus: multiplie the 3. number by the 4, the product ſhalbe your diuiſor: thē multiply the firſt number by yͤ ſeconde, & the product therof by the fift, yͤ which number ſhal be your diuidend, or nūber yͭ is to be diuided: as by example.

When 60. crownes in 8. monthes do gaine 6. li. in how many monthes wil 100. crownes gain. 15. li. *Aunſwere:* Multiply the thirde number 6. by the fourth nūber 100: & therof cōmeth 600 then multiplye yͤ firſte number 60. by the ſecōd nūber 8. & by yͤ fift nūber 15. thereof will come 7200. then diuide 7200. by 600. & the quotiēt wilbe 12: in ſo many monthes will 100. crownes gaine 15. li. This queſtion may lykewiſe be done by the double rule of 3.

Crownes	*monthes.*	*pounds.*	*crownes.*	*pounds.*
60.	.8.	.6.	.100.	.15.

x
7 2 |0 0 *monthes.*
6 6 |0 0 (12

3. In the thirde part of the rule of 3. compound,there may be 5.numbers or more: & in this rule yͤ firſt nūber & the laſt are alwayes diſſemblaunt yͤ one to thother: & the queſtiō is from the laſt nūber vnto the firſt, whereof yͤ rule is thus: multiply that number which you would know by thoſe nūbers which do giue yͤ value, & diuide yͤ product of the ſame, by yͤ multiplycation of the nūbers which are already valued,as by exāple. If 4.deniers Pariſis, bee worthe 5.deniers Tournois,& 10.deniers tournois, be worth 12.deniers of Sauoy, I demaūd how many deniers Pariſis are 8. deniers of Sauoy worth? *Aunſwere*: Multiply 8.deniers of Sauoy (which is the nūber yͭ you would knowe) by 4.deniers pariſis,& by 10 deniers tournois which are the nūber yͭ giue yͤ value, & they make 320: then multiplie 5.deniers tournois,by 12 deniers of ſauoy (which are yͤ nūbers already valued) & thei make 60: laſtly diuide 320.by 60

and you ſhal finde 5.deniers $\frac{1}{3}$ pariſis, ſo muche are the deniers of Sauoye worth.

Pariſis.tournois.tournois.ſauoy.ſauoy.
4.*d.* .5 *d.* .10 *d.* .12 *d.* .8 *d.*

32 | 0 *par.*
6 | 0 (5.*d.* $\frac{1}{3}$.

4. In the fourthe parte of the rule of thre compounde: the fyrſt number and the laſt are always ſemblant and of one denomination, and the queſtiō of this rule, is allwayes from the laſt number to yͤ laſt ſauing one. Whereof there is a rule which is thus. You muſt multiplye that number which you woulde knowe, by the numbers that are alreadye valued, and diuide the product of the ſame, by the multiplication which commeth of the nūbers that giue yͤ value, as by exāple.

If 4.deniers Pariſis, bee worth 5. Deniers Tournois, and 10. Deniers Tournois, be worthe 12. Deniers of Sauoy, I demaunde how many Deniers of Sauoy, are 15. Deniers Pariſis worth. *Aunſwere*: Multiplye 15. Deniers Pariſis that you woulde knowe, by 5. Deniers Tournois, & by 12. Deniers of Sauoye, which are the numbers alreadye valued, and thei make 900. Diuide the ſame by 4. times 10. which are the numbers that doe giue the value, and you ſhal finde 22. Deniers ½ of Sauoye, ſo much are the 15. Deniers Pariſis worth.

Pariſis.	*tournois.*	*tournois.*	*Sauoy.*	*Pariſis.*
4.*d.*	.5 *d.*	.10 *d.*	.12 *d.*	.15 *d.*

2 |
90 | 0 *Sauoy.*
44 | 0 *(22.d.* ½

The thirde Chapter treateth of *queſtions of the trade of Marchaundiſe.*

IF 31. Deuonſh. doſes do coſt me 100.li.15.ſhil. What ſhall 4. doſens coſt? *Aunſwere*: fyrſt bring the 100.li.15.ſhill. all into ſhillings, in multiplying yͤ 100.li. by 20. adding to the product the 15. ſhill. and thereof commeth 2015. ſhill. then multiplye 2015. by the thirde number 4. and diuide the product by 31. and the quotient wilbe 260. s. The which diuide againe by 20. and therof commeth 13. li.

Doſens. *Doſens.*

31. 100.*li.* 15.*ſh.* 4.*d.*

20

2015

4

8060.

~~1~~

~~2~~ ~~8~~

~~8~~ ~~0~~ ~~6~~ ~~0~~ (260.

~~3~~ ~~1~~ ~~1~~ ~~1~~

~~3~~ ~~3~~

If foure Doſens be worth 13. pound. What are 31. Doſens worthe by the price? *Aunſwere:* Multiply 31. by 13. and therof cõmeth 403. The which you ſhall diuiſe by 4. and thereof commeth and thereof commeth 100.li.$\frac{3}{4}$, which $\frac{3}{4}$ are 15.s.and ſo much are 31.Doſens worth as before.

Doſens.	*li.*	*Doſens.*
4.	.13.	.31.
		13
		393
		1
		403.

403
444 (100.li.$\frac{3}{4}$

If 49.elles be worth 2.li. 4.s.11.d. what are 18.elles worth by the price? Firſt you muſt bring 2.li.4.s.11.d.all into pence,in multiplying 2.li. by 20. maketh 40.adde thereto 4. ſhil. they make 44.s.yͤ which multiply by 12.d & thei make 528.d.wherunto adde 11.d all is 539.d.the which 539.d. muſte be your ſecond nũber in yͤ rule of 3. then multiply 539. by 18.& therof commeth 9702. diuide yͤ ſame by 49.& you ſhal haue in your quotient 198.d. yͤ which diuide by 12. & you ſhal finde 16.s.6.d. ſo much are the 18. elles worthe.

Elles: *Elles.*

49. 2.*li.* | 4.*ſh.* | 11.*d.* .18

20 539

44 162

12 54

99 90

44

539 9702

~~1~~ ~~5~~ ~~1~~

~~4~~ ~~2~~ ~~7~~ ~~7~~ ~~6~~

~~3~~ ~~8~~ ~~6~~ ~~1~~ ~~9~~ 8 (16.*ſh*.6.*d*

~~9~~ ~~7~~ ~~0~~ ~~2~~ (198. ~~1~~ ~~2~~ ~~2~~

~~4~~ ~~3~~ ~~9~~ ~~9~~ ~~1~~

~~4~~ ~~4~~

If 18. elles be worth 16.s.6.d. what are 49.elles worth by yͤ price ? *Aunſ.* bring 16.s. 6.d. into pence, in multiplying 16.by 12.and thereof commeth 198.d. with the 6.d. added to it, then multiplye 198 by 4 9. the product will be 9702. The which diuide by 18.elles and therof commeth 539.d. Then diuide 539.d. by 12.and the product therof by 20. So ſhall you haue 2.li. 4.ſh. 11.

11.d.ſo much are the 49.elles worth.

Elles.		*Elles.*
18.	.16.*ſh.* 6. *d.*	.49
	12	198
	32	392
	166	441
	198	49
		9702

  1 7   1
4 4 6   2 5 1
9 7 0 2 (539.   5 3 9 (44.*ſhill.*
1 8 8 8   1 2 2
  0 1   1

If a yarde of Veluet coſt 19.s.what ſhall $\frac{3}{4}$ of a yarde coſt? *Aunſwere*: ſette down your numbers thus. If $\frac{1}{1} \mid \frac{19}{1} \mid \frac{3}{4}$. Then multiplye 1. times 19.by 3. and therof cõmeth 57.for your diuidende, or number to be diuided. The which 57.you ſhall diuide by 1.times 1, foure times, which are 4, and your quotiẽt wil be 14.s.$\frac{1}{4}$, which $\frac{1}{4}$ is worth 3.d.ſo much are the $\frac{3}{4}$ of a yarde worth after 19.ſhil. the yarde, as by practiſe followeth.

$\frac{1}{1}$ | $\frac{19}{1}$ | $\frac{3}{4}$ |

x1
57 (14.ſh.$\frac{1}{4}$
44

Or otherwiſe by the rules of practiſe: firſt for $\frac{2}{4}$ of a yarde which is $\frac{1}{2}$ of a yarde, you muſte take the $\frac{1}{2}$ of 19.s. which is 9.s.6.d. then for $\frac{1}{4}$, take the $\frac{1}{2}$ of the product, that is to ſaye, of 9.s. 6.d. and thereof cōmeth 4.s.9.d. adde theſe nūbers togither, & you ſhall haue 14.s.3.d. as aboue is ſaid, and as appeareth here in the margent.

19. ſhil.
9.ſh.6.d.
4. .9.
14. .3.d.

If $\frac{3}{4}$ of a yarde of Veluet do coſt 14. ſhil.3.d. What ſhall 1. yarde coſte ſet your numbers downe thus: if $\frac{3}{4}$ | 14 $\frac{1}{4}$ | $\frac{1}{1}$. Reduce 14.$\frac{1}{4}$ into a fraction, and they wil be $\frac{57}{4}$ thē multiply 57. by 1.4. times, & thereof cōmeth 228. for your diuidend. Likewiſe multiply 1.

4.3.times,& therof cōmeth 12.foꝛ your diuiſoꝛ: then diuide 228. by 12. & your quotient wil be 19.ſhil.ſo much is the yarde of veluet woꝛth.

$$\frac{3}{4}\ \Big|\ \overset{57}{14}\,\frac{1}{4}\ \Big|\ \frac{1}{1}$$

$$\begin{array}{ccc} & \cancel{1} & \\ \cancel{1} & \cancel{0} & \\ \cancel{2} & \cancel{2} & \cancel{8} \\ \cancel{1} & \cancel{2} & \cancel{2} \\ & \cancel{1} & \end{array}\ (19.\text{ſhil.}$$

Oꝛ otherwiſe by yͤ rule of pꝛactiſe: you ſhall take the $\frac{1}{2}$ parte of 14.ſh.3.d. and adde it with the ſame 14.ſh. 3.d. and you ſhall haue 19.ſhill. as befoꝛe.

14. *ſhil.*	3. *d.*
4.	.9. *d.*
19. *ſhil.*	.0. *d.*

If one ell of Hollande clothe be woꝛth 5.s. what are $\frac{2}{3}$ woꝛth after the rate? *Aunſwere*, ſay thus if $\frac{1}{1}\ |\ \frac{5}{1}\ |\ \frac{2}{3}$. Then multiply 2.times 5. one time, and therof commeth 10.foꝛ your diuidende: likewiſe multiply thꝛe times 1. one time, thei make 3.foꝛ your diuiſoꝛ, then diuide 10. by 3.& thereof commeth 30.s $\frac{1}{3}$ which $\frac{1}{3}$ is woꝛth 4.pēce, &

ſo much are the $\frac{2}{3}$ of an ell worth.

$\frac{1}{1} \mid \frac{5}{1} \mid \frac{2}{3} \mid$

$$\begin{array}{l} \;\,1 \\ \cancel{1}0 \\ \;\,\cancel{3} \end{array} \quad (3.\text{ſhil.}\tfrac{1}{3}$$

Or otherwiſe, by the rule of practiſe: take firſt the $\frac{1}{3}$ of 5.s. for the $\frac{1}{3}$ of an ell, which is 1.s.8.d. Likewiſe, for the other $\frac{1}{3}$ of an ell take againe another $\frac{1}{3}$ of 5.s. which is alſo 1.ſh.8.d. and adde them together, and ſo ſhall you haue 3.s.4.d. as before.

5.ſhill.

1. .8

1. .8

3.ſhill. 4 *d.*

If $\frac{2}{3}$ of an ell of Hollande cloth doe coſt me 3.s.4.d. what ſhal the el coſt? *Aunſwere:* ſet down your ſũme thus, if $\frac{2}{3} \mid 3\frac{1}{3} \mid \frac{1}{1}$. Firſt reduce $3\frac{1}{3}$ all into thirdes, and it will be. $\frac{10}{3}$. Then multiply 1. times 10. 3. times, and thereof cõmeth 30. for your diuidẽd. Likewiſe multiplie 1. times 3. 2 times, youre quotiẽt wil be 6. then diuide 30. by 6. & you ſhall haue 5. s. ſo much is the ell of Hollande clothe worth.

$$\begin{array}{lllll} & 10 & & & 50 \\ 2 & |\ 3\frac{1}{3} & |\ \frac{1}{1} & & 6\ (5.ſh. \end{array}$$

Or otherwiſe by practiſe, take the $\frac{1}{2}$ of 3.s. 4.d. which is 1.s.8.d. & adde it to the ſame 3.s. 4.d. and therof wyll come 5.s. as before. For the $\frac{1}{3}$ of 5.s. is as much as the $\frac{1}{2}$ of 3.s. 4.d. which was the price that the $\frac{2}{3}$ of an elle did coſt, as appeareth.

3.ſh.	4.
1.	8.
5.ſh.	0.d.

If one ell coſt me 17.s. what ſhal. 15. elles $\frac{1}{8}$ part coſte? which $\frac{1}{8}$ is halfe a quarter of an elle. *Aunſwere:* ſaye, of $\frac{1}{8}$ | $\frac{17}{1}$ | 15. $\frac{1}{8}$. Firſt reduce 15 $\frac{1}{8}$ into eight partes, and they make $\frac{121}{8}$ then multiplie 121. by 17. 1 time, and thereof commeth 2057. for your diuidende. Likewiſe multiply 8. times 1. 1. time, and your quotient wyll bee 8. for your diuiſor, then diuide 2057. by 8. and you ſhall fynde 257.ſh. $\frac{1}{8}$, whiche is 12.li. 17.ſhil. 1.d.$\frac{1}{2}$ and ſo muche are the 15 elles $\frac{1}{8}$ worth, as by practiſe doth appeare.

$\frac{8}{1}$ | $\frac{17}{1}$ | $\frac{121}{15\frac{1}{8}}$

Or otherwiſe, for 10 ſh. take yͤ $\frac{1}{2}$ of 15 which is 7 li. 10 ſh. then for 5 ſh. take the $\frac{1}{2}$ of 7.li. 10.s. which is 3.li. 15.s. thirdly for 2.s. take yͤ $\frac{1}{5}$ of 7.li.10.s. bicauſe yͤ $\frac{1}{5}$ of 10. ſh. is 2. ſh. Fourthlye, for the $\frac{1}{8}$ of yͤ ell, you ſhal take the $\frac{1}{8}$ of 17.s. which is 2.s. 1.d. $\frac{1}{2}$. Laſtlye, adde all theſe ſummes togither, and thẽ ſhal you find 12.li. 17.s.1.d. $\frac{1}{2}$ as before, and as appeareth more plainly in the margent.

15. $\frac{1}{8}$.
17.s.

7. .10. .
3. .15. .
1. .10. .
2. 1 $\frac{1}{2}$.
(12.li.17.s.1.d. $\frac{1}{2}$

If 25. elles be worthe 2.li.3.s.4.d. what are. 18 elles $\frac{3}{4}$ worth by yͤ price? *Aunſwere:* firſt put 3.s.4.d. into yͤ part of a li. and you ſhal haue $\frac{1}{6}$ then ſay, if $\frac{25}{1}$ giue me 2.li. $\frac{1}{6}$ what ſhall 18 $\frac{3}{4}$ giue? put yͤ whole number into his brokẽ, and then multiplie 1. times 13. by 75. yͤ product will be 975. the whiche you ſhall diuide by 25. times 6.4. times, which maketh 600. Then diuide 975. by 600. and your quotient will be 1.li. and 375. remaineth, yͤ which 375. you ſhall multiplie by 20. thereof cõmeth 7500. diuide yͤ ſame by 600. your quotient wil be 12.s. and 300. remaineth yͤ which abbreuiated bringeth $\frac{1}{2}$ which is 6.d: thus yͤ 18 elles $\frac{3}{4}$ are worth 1.li. 12.s.6.d. as by practiſe appeareth.

$$\frac{25}{1} \Big| \frac{13}{2\frac{1}{6}} \Big| \frac{75}{18\frac{3}{4}}.$$

Or otherwiſe by the rules of practiſe: for bicauſe that 12. elles $\frac{1}{2}$ is the $\frac{1}{2}$ of 25. elles, therfore take the $\frac{1}{2}$ of 2.li. 3.s. 4.d. which is 1.li. 1.s. 8.d. then for 6. elles $\frac{1}{4}$ take the $\frac{1}{4}$ of 2.li. 3.s. 4.d. or elſe the $\frac{1}{2}$ of the laſt product (that is to ſay of 1.li. 1.s. 8.d.) which is all one, & adde them togither, ſo ſhal you haue 1.li. 12.s. 6.d. as before.

.2.	.3.	.4.
.1.	.1.	.8.
	.10.	.10.
1.li.	12.s.	6.d.

If 15. yardes be worth 32.s. what are halfe a yarde or halfe a quarter or elſe $\frac{5}{8}$ of a yarde worth. *Aunſwere:* ſay, if $\frac{15}{1}$ giue $\frac{32}{1}$ what wyll $\frac{5}{8}$ giue? Multiplie 1 times 32. by 5. and diuide the product by 15. times 1. ſhil. and 4. remaineth, which is $\frac{1}{3}$ of a ſhil. that is to ſay 4.d. and ſo much are the $\frac{5}{8}$ of a yarde worth.

$\frac{15}{1}$ | $\frac{32}{1}$ | $\frac{5}{8}$

Or otherwiſe, ſe what the yarde is worth after the maner aforeſaid in yͤ other examples, & you ſhal find yͭ the yard is worth 2.s.1.d $\frac{3}{5}$ of yͤ which nūber take firſt yͤ $\frac{1}{2}$ for $\frac{4}{8}$ which is 1.s.0 d. $\frac{4}{5}$, of the which nūber, take the $\frac{1}{4}$ for yͤ other $\frac{1}{8}$ which is 3 d. $\frac{1}{5}$, adde theſe two nūbers togither, and you ſhal finde yͤ $\frac{5}{8}$ to be worth 1.s.4.d. as before is ſaid

2.ſh. 1.d. $\frac{3}{5}$.

---

1. 0. $\frac{4}{5}$.

1.ſh. 4.d. 0.

If 13.els $\frac{5}{6}$, be worth 27.s. what are 10.elles $\frac{2}{3}$ worth by yͤ price? *Aunſwere:* ſay if 13. $\frac{5}{6}$ giue $\frac{27}{1}$, what ſhal 10. $\frac{2}{3}$ giue: put the whole nũbers into their broken, & you ſhall finde $\frac{83}{6}$, $\frac{27}{1}$, & $\frac{32}{3}$. Thẽ multiplie 6.times 27.by 32. & thereof commeth 5184. the which nũber you ſhall diuide by 83.times 1.thre times, and you ſhall finde 20.ſh. $\frac{68}{83}$ which is worth 9.d. $\frac{69}{83}$ part of a penny.

$$\begin{array}{ccccc} 83 & & & & 32 \\ 13\frac{5}{6} & | & \frac{27}{1} & | & 10\frac{2}{3} \end{array}$$

If two yardes $\frac{1}{2}$ be worth 4.s. 8.d. what are 8.yards $\frac{1}{4}$ worth? *Aunſwere:* put the 8.d.into the part of a ſhilling, which wilbe $\frac{2}{3}$ then reduce the whole numbers into their broken, and they will ſtande thus. $\frac{5}{2}$, $\frac{14}{3}$, $\frac{33}{4}$, then multiplie two times 14. by 33. and diuide yͤ product by 5. times 3. 4. times, & you ſhall finde 15.s.4.d.$\frac{4}{5}$, ſo much are the eyght yardes $\frac{1}{4}$ worth.

$$\begin{array}{ccccc} \overline{\quad 5 \quad} & & \overline{\quad 14 \quad} & & \overline{\quad 33 \quad} \\ 2\ \frac{1}{2} & | & 4\ \frac{2}{3} & | & 8\ \frac{1}{4} \end{array}$$

If one kerſey bee worth 2.li.6.s. 8.d.how many kerſeys ſhall I bie for 36.Li.3.s. 4.d. after ẏ rate? *Aunſwere*: put 6 s. 8 d.into the part of a Li.& you ſhall haue 2.Li. $\frac{1}{3}$ for the firſt number in the rule of 3.and 1. ell for the ſecond number: then put 3.s. 4.d. into the part of a Li.and you ſhall finde 36.Li.$\frac{1}{6}$. for the third number, then will your 3.nūbers in the rule of 3.ſtande thus. 2.$\frac{1}{3}$ | $\frac{1}{1}$ | 36 $\frac{1}{6}$. Therefore reduce the whole numbers into their broken, & you ſhal haue $\frac{7}{3}$ | $\frac{1}{1}$ | $\frac{217}{6}$. Then multiply 3 times 1. by. 217. & therof will cōe 651. for your diuidende. Likewiſe, multiply 7 times 1.by 6.& the product therof will be 42.Then diuide 651.by 42.and you ſhall finde 15.$\frac{1}{2}$. So many kerſeys of 2.Li.6.s. 8.d.the peece, ſhall you haue for 36.Li. 3.s. 4. d.

$$\frac{7}{2\frac{1}{3}}\Big| \qquad \Big|\frac{217}{36.\frac{1}{6}}$$

¶ The 4. Chapter treateth of loſſes and gaines, in the trade of Marchaundiſe.

If 13. yards $\frac{1}{3}$ be worth 22.li.10.s. how ſhall I ſel the yarde to gaine $\frac{1}{3}$, or to make of 3.4? which is all one? *Aunſ.* ſay by the rule of 3. if 3. be come of 4. or if 3. yelde 4. what will 22. $\frac{1}{2}$ yelde: multiplie & diuide and you ſhal fynde 30.li. Then ſay gaine by the rule of 3. if 13. yardes $\frac{1}{3}$ doe giue 30.li. aſwell of principal as of gaine: what wil 1. yard be worth by the price? Multiply and diuide, and you ſhall find 2.li.5.s. and for that price muſt the yarde be ſolde to gaine the $\frac{1}{3}$, or to make of 3.4.

$$\frac{3}{1} \;\Big|\; \frac{4}{1} \;\Big|\; \frac{45}{22\frac{1}{2}} \;\Big\|\; \frac{40.}{13\,\frac{1}{3}\;\frac{30}{1}} \;\Big|\; \frac{1}{1}$$

Or otherwiſe, take the $\frac{1}{3}$ part of 22. li. 10.s. which is 7.li. 10.s. that ſhall you adde with 22.li.10.s. and you ſhal haue 30.li. as before. Then diuide 30. by 13. $\frac{1}{3}$, & you ſhall fynde 2.li.5.s. as aboue is ſaid.

22.	.10.s.
7.	.10.
30.	.00.

If one yarde bee worth. 27.ſh. 6.d. for how much ſhal 16. yards $\frac{2}{3}$ be ſolde to gaine 2.s. vpon yͤ pound of money, yͭ is to ſay: vpō 20.s. *Anſwere*, adde 2. vnto 20. and you ſhal haue 22, thē ſay: if 20.s. of principall, doe giue 22.s. as wel of principal as gaine: how much wil 27.s. 6.d. principall yelde. Multiplie and diuide & you ſhall finde 30.s. $\frac{1}{4}$: then ſaye againe by the rule of 3. if one yarde do giue me 30.s. $\frac{1}{4}$ (which is aſwel the principal as yͤ gaine) what ſhall. 16. yardes $\frac{2}{3}$ giue me? Multiplie and diuide, and you ſhall finde 25. li. 4.s. 2.d. For the ſame price ſhall the 16. yardes $\frac{2}{3}$ be ſolde to gaine after the rate of 2.s. vpon the pound of money, or in 20.s. which is all one.

$$\frac{20}{1} \;\Big|\; \frac{22}{1} \;\Big|\; \frac{55.}{27\frac{1}{2}.} \;\Big\|\; \frac{1}{1} \;\Big|\; \frac{121}{30\frac{2}{4}} \;\Big|\; \frac{50}{16\frac{2}{1}}$$

If 10. yardes $\frac{2}{3}$ be worthe 25.li. 10.s. For how much ſhal 2 yardes $\frac{1}{4}$ be ſold to gaine after 10.li. vpon the 100.li. of money? *Aunſwere:* ſay if 100. of principall yelde 110. as well pꝛincipall as gaine, how muche will 25. 10.s. yelde me? Multiply & diuide, and you ſhall finde 28.li. 1.s. Then ſaye if 10.yardes $\frac{2}{3}$ do yelde me 28.li.1.ſh.aſwel of pꝛincipal as of gaine, how much ſhal two yardes $\frac{1}{4}$ yelde me? multiply & diuide & you ſhall finde 5.li.18.s.4.d.$\frac{1}{12}$, foꝛ ſo much ſhall the 2. yardes $\frac{1}{4}$ be ſolde to gaine after 10.li.vpō yͤ 100.li.of mony.

$$\frac{100}{1} \mid \frac{110}{1} \mid \overset{5\ 1}{25\frac{1}{2}} \parallel 10\frac{2}{3} \mid 28\frac{1}{20} \mid 2\frac{1}{4} \mid$$

And although that in theſe queſtions of gaine and loſſe, ſometimes the fyꝛſt number is not like vnto yͤ thirde number, that is to ſaye, of the ſame denomination: as one woulde ſaye: if 20.s. gaine 2.ſhil. what ſhall 50.li. gaine? oꝛ 25.li.&c. Oꝛ if 20.li.do gain 2.li. What ſhall 25.s. gaine mee, oꝛ what ſhall 27.ſh.$\frac{1}{2}$ gaine? Yet neuertheleſſe, the rule is not therfoꝛe falſe. Foꝛ if 20.s. doe gaine 2.s: 20.li. ſhall gaine 2.li.& 20.d.ſhall gaine 2.d. likewiſe

wiſe 20.crownes ſhall gaine 2. crownes, and ſo of all other: thereforꝛe it is to be vnderſtand, that the firſt nūber in theſe reaſons is pꝛeſuppoſed to bee ſemblable to the thirde.

When one Marchant ſelleth wares to another, and hee giueth to the byer 2. vpon 15: howe much ſhall the byer gaine vpō the 100. after the rate? *Aunſwere*; ſay if 15. giue 17. what ſhall 100. giue? Multiplie and diuide, and you ſhall finde $113\frac{1}{3}$, ſo the byer getteth after the rate of $13\frac{1}{3}$ vpon the 100.

15 | 17 | 100.

If one noꝛthen doſen coſt me 3.li.5.s. & I ſel the ſame againe foꝛ 3.li. 12.s. 6.d. how much doe I gaine vpon the pounde of money after yͤ rate? *Aunſ.* ſay if 3.li.$\frac{1}{4}$ doe giue 3.li.$\frac{5}{8}$ what ſhal $\frac{20}{1}$ giue, put the whole nūber into their bꝛoken & you ſhal haue $\frac{13}{4}$, $\frac{29}{8}$, $\frac{20}{1}$, then multiply 4. times 29. by 20. & thereof commeth 2320. foꝛ your number that is to be diuided, likewiſe multiply 13. times 8. 1 time, & therof cōmeth 104.

Then diuide 2320. by 104. & you ſhall finde 22.s. $\frac{4}{13}$. So I ſhal get 2.s. $\frac{4}{13}$ vpon 20.s. or vpon the li. of money.

$$\frac{13}{3\frac{1}{4}} \Big| \frac{29}{3\frac{5}{8}} \Big| \frac{20}{1} \Big|$$

If a yarde of cloth coſt me 7.s.8.d. & afterwarde I deliuer out 13. yardes $\frac{1}{4}$, for 4.li.13.s. 4.d. I woulde knowe whether I doe winne or loſe, & how much vpon the 100.Li. of money?
Aunſwere: ſee firſt at 7.s.8.d. the yard, what the 13. yardes $\frac{1}{4}$ ſhall coſte, and you ſhal finde 5.li. 1.s.7.d. And I ſold them but for 4.li. 13.s.4.d. ſo yͭ I doe loſe vpon the 13. yardes $\frac{1}{4}$ the ſumme of 8.s. 3.d. Then for to knowe howe much is loſt vpon the 100: ſaye by the rule of three, if 5.li. 1.s. 7.d. doe loſe 8.s. 3.d. What will 100. loſe? Fyrſt, put 1.ſhil.7.d. into the part of a li. and it will be $\frac{19}{240}$. Likewiſe put 8.s. 3.d. into the part of a li. and it is $\frac{33}{80}$. Then will your nūbers ſtand thus 5 $\frac{19}{240}$, $\frac{33}{80}$, $\frac{100}{1}$, put the whole into his brokē, and then

then multiply and diuide, ſo you ſhal finde 8.li. $\frac{1184}{9752}$ which is worth 2.ſh.5.d. $\frac{169}{1219}$ and ſo muche is loſte vpon the 100.li. of money.

$$\frac{1219.}{5\ \frac{19}{240}.}\ \Big|\ \frac{31}{80}\ \Big|\ \frac{100}{1}.$$

More, if 12. yardes $\frac{1}{2}$ of ſcarlet be ſolde for 30.li.15.s. vpon the which is gained after the rate of 11 $\frac{1}{9}$ vpon the 100. I demaunde what the yarde dyd coſt at the firſt. *Aunſwere*: from 30.li. 15.s. ſubſtract his $\frac{1}{10}$ part which is 3.li. 1.s.6.d. and there reſteth 27.li.13.s.6.d the which number multiplied by 2. bringeth 55.li.7.s. of the which is u.li one ſhilling and foure pence.

Then take againe the $\frac{1}{5}$ of the ſaide 11 pounde 1.ſhil. 4.pence, which is 2. pounde 4.ſhillinges thre pence. $\frac{9}{25}$.
And ſo muche did the Elle coſt
at the fyrſt pennye.

30.li.	15.ſh.		
3.	1.ſh.	6.d.	
27.	13.	6.	
2.			
55.	7.	0.	
11.	1.	4.	$\frac{4}{5}$.
2.	4.	3.	$\frac{2}{25}$.

More, if 15. yardes $\frac{3}{4}$ of ſcarlet doe coſt me 32.li. 13.s. 4.d. And I ſell the yarde againe for 2.li. whether doe I winne or loſe, and howe much vpon the pounde of money.

Aunſwere: Loke what the 15. yardes $\frac{3}{4}$ are worth at 2.li.the yarde,and you ſhall finde yͭ they are worth 31.li.10.s. But they did coſt 32.li. 13.s. 4.d. ſo yͭ there is loſt vpō yͤ whole 1.li.3.s.4.d. Then,to know how much is loſt vpō the li.ſay by the rule of thre, if 32.li.$\frac{2}{3}$ doe loſe 1.li.$\frac{1}{6}$: what will $\frac{1}{8}$ loſe? that is to ſay, what will 1.li. loſe? reduce the whole nūbers into their brokē, & then multiplie & diuide, ſo ſhall you finde $\frac{21}{588}$.part of a li. Then multiplye 21. by 240. bicauſe ſo many pence are in a li. & diuide the product by 588. ſo ſhall you finde 8.d. $\frac{336}{588}$ which being abbreuiated doe make $\frac{7}{4}$, & thus you ſe yͤ 8.d. $\frac{4}{7}$ is loſt vpon the li. of money.

$\frac{98}{32\ \frac{2}{3}}$ | $\frac{7}{1\ \frac{1}{6}}$ | $\frac{1}{1}$ |

If 1. yarde of cloth of tiſſue be ſolde for 3.li.15.s. whereupon is loſt after yͤ rate of 10.s. vpon the 100. I demaunde what 12. yardes $\frac{1}{2}$ of yͤ ſame tiſſue did coſt? *Aunſwere:* adde vnto 3.li.15. hys owne $\frac{1}{10}$ part, which is 7.s.6.d. and al amounteth to 4.li. 2.s. 6.d. then loke what the 12. yardes $\frac{1}{2}$ wil amount vnto, after 4.li. 2.s. 6.d. & you ſhal finde that they will come to 51.li.11.s.3.d. ſo much did the 12. yardes $\frac{1}{2}$ coſt.

3.li. 15.s.	12.		$\frac{1}{2}$
7.s.6.d.	4.li.	2.s.	6.d.
4.li.2.s.6.d.	48.	.00.	.0.
	1.	.10.	.0.
	2.	.01.	.3.
	51.li.	11.s.	3.d.

More, if I ſell one wilſhire white for 6.li. 12.s. whereupon I doe gaine after the rate of 2.s. vpon the li. of money, that is to ſaye, vpon 20.s. I demaunde what 11.peeces of the ſame whites did coſt mee? *Aunſwere:* abate from 6.li. 12.s. (which is 132.s.) hys $\frac{1}{11}$ part, & thereof cōmeth 12.s. and there remaineth 120.s. or 6.li. Thē ſee at 6.li yͤ cloth, what the 11.clothes are worth 66.li. ſo much did the 11. clothes coſte.

132.ſh.	11
12.ſh.	6
120.ſh.	66.li.

If I ſell 10. elles $\frac{1}{2}$ of Hollād for 22 s.6.d. whereupon I do loſe after the rate of 2.s. vpon the li. of money. I demaunde what the ell did coſt mee? *Aunſwere:* ſay by yͤ rule of 3. if 18. giue 20.s. what will 22.s.6.d. giue? Multiplie & diuide, & you ſhall fynde 25.s. Then diuide 25.s. by 10.$\frac{1}{2}$, & thereof cōmeth 2.s.4.d.$\frac{4}{7}$. So much did yͤ el coſt.

$\frac{11}{1}$	$\frac{20}{1}$	$22\frac{1}{2}$

If I ſell one clothe for 5 li. wher vpon I do loſe after 10 vpon ȳ 100, I demaunde how muche I ſhould loſe or gayne vpon the 100, in caſe I had ſolde the ſame for 5 li. 10 ſhil. *Aunſwere*: ſaye, if 90 yelde 100, howe muche wyl 5. li. giue? Multiplie & diuide, & you ſhall finde 5. li. $\frac{5}{9}$: then ſay againe by ȳ rule of thre, if 5. $\frac{5}{9}$ come to 5. $\frac{1}{2}$, what wyll 100. come vnto? Multiplie & diuide, & you ſhal finde 99. li. which being abated from 100. there wyll remaine 1. li. and ſo much is loſt vpon the 100.

$$90.\quad 100.\quad 5.\ \|\ 5\tfrac{5}{9}\ |\ 5\tfrac{1}{2}\ |\ \tfrac{100}{1}\ |$$

¶ *The 5. Chap. treateth of lengthes & breadthes of tapiſtry, and other clothes.*

If a peece of tapiſtry be 5 elles $\frac{3}{4}$ longe, and 4 elles $\frac{2}{3}$ in breadth, how mani elles ſquare doth the ſame pece conteine? *Aunſwere*: Multiplie the length by the breadth, that is to ſaye 5. $\frac{3}{4}$ by 4. $\frac{2}{3}$, and thereof commeth 26. elles $\frac{5}{6}$ ſo many elles ſquare

ſquare doth yͤ ſame peece conteine.

More, if a peece of Tapiſtrie doe conteine 32. ells ſquare, and yͤ ſame being in lẽgth 6.elles $\frac{1}{4}$. I demaũde how many elles in breadth yͤ ſame peece doth conteine. *Anſ.* diuide 32. elles by 6 $\frac{1}{4}$ and thereof commeth 5. $\frac{3}{25}$: So many elles dothe the ſame peece conteine in breadth.

More, a peece of clothe beyng 13. yardes $\frac{1}{3}$ in length, and 5 quarters $\frac{1}{2}$ in breadth, how many yardes of $\frac{2}{3}$ & $\frac{1}{2}$ broade will the ſame peece make? *Anſwere*: ſee what parte of a yarde, the $\frac{5}{4}$ and $\frac{1}{2}$ be, and you ſhall finde yͭ they make 1 yarde $\frac{3}{8}$. Thẽ multiply 13. yardes $\frac{1}{3}$ by 1 yarde $\frac{3}{8}$ and you ſhall haue 18. yardes $\frac{1}{3}$ in ſquare yͤ which you muſt diuide by $\frac{2}{3}$ & $\frac{1}{2}$ yͭ is to ſaye by $\frac{5}{6}$, (bicauſe yͤ $\frac{2}{3}$, $\frac{1}{2}$ being brought into 1 fraction maketh $\frac{5}{6}$) & you ſhall finde 22.yards: So many yardes of $\frac{2}{3}$ & $\frac{1}{2}$ large doth yͤ ſame peece conteine.

More, a marchant hath bought 4. yardes $\frac{2}{3}$ of cloth being ſyxe quarters $\frac{1}{2}$ broade to make him a gowne the which he will line thorowout, wyth black Say of three quarters of a yarde broad, I demaund how much Say he muſt bye? *Anſwere:* Multiply yͤ lẽgth of the cloth, by the breadth, that is to ſay 4 $\frac{2}{3}$ by 1. $\frac{5}{8}$, (which is the ſyx quarters $\frac{1}{2}$) and therof commeth 7. yardes $\frac{7}{12}$, the which diuide by $\frac{3}{4}$ & you ſhall finde ten yardes $\frac{1}{9}$. So many yardes of Say muſt he haue to line the ſame 4. yards $\frac{2}{3}$ of cloth of 6. quart. $\frac{1}{2}$ broad.

More, at 6. s. 8. d. the ell ſquare, what ſhall a peece of tapiſtre coſt me, which is fiue ells $\frac{1}{2}$ long and 4. ells $\frac{1}{4}$ broade? *Aunſwere,* multiply 5. $\frac{1}{2}$ by 4. $\frac{1}{4}$ and therof cõmeth 23. ells $\frac{1}{8}$ ſquare: then ſay by the rule of three, if one ell ſquare coſt me 6. s. 8. d. what ſhal 23. $\frac{1}{8}$ coſt? Multiplie and diuide, and you ſhall finde 7. li. 15. s. 10. d. ſo much the ſaide peece of tapiſtrie did coſt.

Or otherwiſe, by the rules of practiſe, take the $\frac{1}{3}$ of 23. $\frac{3}{8}$: and you ſhall finde 7.li. 15.s.10.d. as aboue is ſaide.

More, a peece of Hollande clothe conteining 42.elles $\frac{2}{3}$ flemiſhe, how many elles engliſhe doe they make? Here muſt you fyrſt note that 100.els flemiſhe, doe make but 60.elles engliſhe, and ſo conſequentlye fiue elles flemiſhe doe make but 3. els engliſh. Therefore ſay by the rule of 3.if 5.els flemiſhe doe make three ells engliſh, how many elles engliſhe will 42.els $\frac{2}{3}$ flemiſhe make. Multiplye & diuide, ſo ſhall you finde 25. elles $\frac{3}{5}$ engliſhe, and ſo many elles engliſhe doth 42. $\frac{2}{3}$ flemiſhe conteine, the like is to bee done of all others.

More, I haue bought a peece of Tapiſtrie, being 5.elles $\frac{1}{4}$ longe, and 4.elles $\frac{2}{3}$ broade meaſure of Flaunders, I demaunde howe many elles ſquare it maketh Engliſhe meaſure?

Anſwere.

Firſt, foraſmuch as three ells engliſh are worth 5 elles flemiſhe, therefore put 3 elles engliſh into hys ſquare, in multiplying 3. by him ſelf which maketh 9: likewiſe multiplye 5. in hym ſelfe ſquarely, and it wilbe 25. Then multiplye 5 $\frac{1}{4}$ which is the length of the peece, by 4 $\frac{2}{4}$ which is the breadth, & therof cõmeth 26 elles $\frac{5}{6}$ ſquare: thẽ ſay by yͤ rule of three, if 25 elles ſquare of flemiſhe meaſure, be worth 9 elles ſquare of engliſhe meaſure, what are 26 elles flemiſh $\frac{5}{6}$ worth? multiplie & diuide, and you ſhall finde yͭ they are worth nine elles $\frac{11}{50}$ ſquare of engliſh meaſure.

More at 3 s. 6 d. yͤ ell flemiſh what is the engliſhe ell worth after yͤ rate. *Anſwere*, ſaye if 5. elles flemiſhe bee worth three ells engliſh, what is 1 ell flemiſhe worth? multiply and diuide, & you ſhall fynde $\frac{3}{5}$ of an engliſhe ell. Then ſaye by the rule of 3, if $\frac{3}{5}$ of an engliſhe ell, be worth 3 s. 6 d. what is 1. engliſhe ell worth? multiplie and diuide, and you ſhall finde 5 s. 10 d. ſo much ſhall the engliſhe ell be worth.

More at 6 s. 8 d. the flemiſhe ell ſquare, what is yͤ engliſhe ell worth. *Anſwere*, ſay by the aforeſaid reaſō, if 25 elles flemiſhe ſquare, be worth 9. elles ſquare engliſhe, what is one ell ſquare flemiſhe worth? multiply and diuide, & you ſhall finde $\frac{9}{25}$ of a ſquare engliſhe ell: Then ſaye, if $\frac{9}{25}$ of an engliſhe ell be worth 6 s. 8 d. what is one ſquare ell engliſhe worth? multiplie and diuide, and you ſhall fynde 18 s. 6 d. $\frac{2}{9}$, ſo much ſhal one engliſhe ell ſquare be worth.

¶ The ſixt Chapter treateth of yͤ reducing of the paumes of Genes into engliſh yardes, wherof foure Paumes maketh one engliſhe yarde.

I Haue bought 97. paumes $\frac{1}{2}$ of Genes veluet, & I would know howe many yardes they wyll make? *Aunſwere,* Diuide 97. $\frac{1}{2}$ by 4. and you ſhall haue 24. yardes $\frac{3}{8}$. So many yards doe the 97. paumes $\frac{1}{2}$ cō-teine.

Oꝛ otherwiſe, take ſome other nū-ber at your pleaſure, as 20. paumes, which doe make fiue yardes, and thē ſay by the rule of thꝛee, if $\frac{20}{1}$ paumes, giue $\frac{5}{1}$ yardes, what will 97. $\frac{1}{2}$ giue? Multiplye and diuide, and you ſhall finde 24. yardes $\frac{3}{8}$ as befoꝛe.

Moꝛe, at two ſhillings 7. d. yͤ paume of Genes, what wil the engliſh yarde be woꝛth after the rate? *Aunſwere,* ſay by the rule of thꝛee, if $\frac{1}{4}$ of an engliſh yarde bee woꝛthe twoo ſhillings $\frac{7}{12}$. What is $\frac{1}{1}$ yarde woꝛth? Multiplie & diuide, and you ſhall finde ten ſhil-lings 4. d. So much is the engliſhe yarde woꝛthe.

Oꝛ otherwiſe, multiply 4. paumes (which is one yarde) by two ſhillings 7. pence, and you ſhall finde 10. s. 4. d. as befoꝛe.

If 257. Paumes $\frac{1}{2}$ bee worth 20.li. 16.s. 8.d. What is one yarde worthe after the rate? *Aunſwere*, ſaye: by the rule of 3. if 257. $\frac{1}{2}$ paumes be worth 20.$\frac{5}{6}$, what are $\frac{4}{1}$ paumes worth. Multiply and diuide, and you ſhall fynde $\frac{100}{309}$ part of a pounde, which is worth 6.s.5.pence, $\frac{52}{103}$; ſo much is one yard worthe.

¶ The.vij. Chapter treateth of marchaundiſe ſolde by waight.

At 9.d.$\frac{1}{2}$ the ounce, what is yͤ li. waight worth? *Anſwere*, ſay if $\frac{1}{1}$ giue 9.$\frac{1}{2}$ what will $\frac{16}{1}$ giue multiply and diuide, & you ſhal finde 12.s. 8.d. ſo much is the yarde worth?

Or otherwiſe, by the rules of practiſe for ſyxe pence, take the $\frac{1}{2}$ of 16. which is 8.s. then for 3.d. take the $\frac{1}{4}$ of 16.s. which is 4.s. Finally, for the halpenye, take 16.ob. which are 8.d. adde all theſe numbers togither and you ſhall finde 12.s. 8.d. as before.

More, at 10 d. $\frac{1}{2}$ the ounce, what are 112. li. waight worth after the rate? *Aunſwere*: reduce. 112.li. into oũces, in multiplying. 112.li. by 16. ounces & you ſhall haue 1792. ounces, thẽ ſay by the rule of 3. if $\frac{1}{1}$ | $10\frac{1}{2}$ | $\frac{1792}{1}$: Multiplie and diuide, and you ſhall finde 18816 d. which do make 78. li. 8 s. and ſo much are the 112. li. worth after 10. d $\frac{1}{2}$ the ounce.

At 12. s. 8 d. the li. waight, what is the ounce worth? *Anſwere*: put 12. s. 8 d. into pence, and you ſhall haue 152. pence: then ſay by the rule of 3. if 16. ounces coſt 152 d. what ſhall 1. ounce coſte, multiplie and diuide, and you ſhall finde 9. d. $\frac{1}{2}$, ſo much is the oũce worth.

Or otherwiſe, take the $\frac{1}{4}$ of 12 s. 8. d for 4 ounces, and thereof commeth 3. s. 2. d. then for one ounce, take the $\frac{1}{4}$ of 3. s. 2 d. and you ſhall haue 9. d. $\frac{1}{2}$ as before.

At 32. li. 10. s. the quintall, that is to ſaye, the 100. li. waight: what is 1. li. waight worthe after the ſame rate? *Aunſwere,* Put 32. li. 10. s. all into ſhillings and you ſhall haue 650. s. Then ſay, by the rule of three, if 100 | 650 | 1. multiply and diuide, and you ſhal finde, 6. s. 6. d. ſo much is the li. worthe.

If one pound waight of ſaffron do coſt me 18. s. 8. d. what ſhal 355. li. 10. oũces coſt me by yͤ ſame price? *Aunſwere* ſaye by the rule of 3. if $\frac{1}{1}$ | 18 $\frac{2}{3}$ | 355 $\frac{5}{8}$. Multiply and diuide, & you ſhal finde 331. li. 18. s. 4. d. ſo much are the 355. li. ten ounces worth.

Briefe rules of vvaight.

Who that multiplieth the pence that 1. li. waight is worth by 5. and diuideth yͤ product therof by 12. hee ſhal finde how many poũds in money the quintall is worth, that is to ſay, how much the 100. li. waight is worth.

And contrariwiſe he that multiplieth the pounds of money that the 100. waight is worth by 12. and deuideth the product by 5. ſhall fynde how many pence the pōude waight is worth.

¶ *Example.*

AT ſeuentene pence the pounde waight, what is the 100. pounde waight worth? *Aunſwere,* Multiplye 17. by 5. and thereof cōmeth 85. diuide the ſame by 12. and you ſhall finde 7. pound $\frac{1}{12}$, which $\frac{1}{12}$ is worth one ſhilling and eight pence. So much is the 100. pounde waight worth.

More, at 13.li. the 100.li. waight, what is one pounde waight worthe? *Aunſwere,* Multiplie 13. by 12. amounteth to 156. the which diuide by 5. and you ſhal finde 31.d. $\frac{1}{5}$ which is 2.s.7.d. $\frac{1}{5}$ and ſo much is one pounde waight worth.

The lyke is to be done of yardes; elles, or of any other meaſure, when we recken but fyue ſcore to the hundred.

Briefe Rules for meaſure.

Who that multiplieth the pence that one ell is worth, by 6. And diuideth the product by 12. hee ſhall fynde how many poundes in money yͤ 120. elles are worth, which 120. elles wee count but for a C.

And contrariwiſe, hee that multiplieth the poundes in money that the 120. elles are worth by 12. and diuideth the multiplication by 6. ſhall fynde howe many pence the ell is worthe.

¶ *Example.*

At ten pence the ell, what are 120. elles worth? *Anſwere*, Multiplie 10. d. by 6. and thereof commeth 60: The which diuide by 12. and you ſhall find fyue pounde, ſo many pounds in money are 120. ells worth at 10. d. the ell.

More, at 9. pounde, the 120. elles, what is one ell worthe? *Aunſwere*, Multiplie nine pound by twelue, and therof commeth 108. the which diuide by 6. and you ſhall finde 18. d. ſo much is one ell worth.

The like is to be done of all maner of wares, which are ſold after 120. for the hundred.

¶ Briefe Rules for our hundreth waight here at London, which is after 112.li. for the C.

WHo that multiplieth ẏ pence that one pounde waight is worthe by 28. and diuideth the product by 60. ſhall finde how many pounds in money the 112.li. waight is worth.

AND contrariwiſe, hee that multiplieth the poundes in money that 112.li. is worth by 60. and diuideth the product by 28. ſhall finde how many pence one li. waight is worth.

¶ *Example.*

AT nine pence the pound waight, what is the 112.li. waight worth?

Annſwere: multiplie 9. d. by 28, and thereof cōmeth 252, the which diuide by 60. & you ſhall finde 4.li. $\frac{12}{60}$ which being abbreuiated is $\frac{1}{5}$ of a pounde, which is worthe 4.s. And thus the 112.li. is worth 4. pound 4. ſhil.

At 8.li. yͤ 112.li. waight, what is 1.li. waight worth? *Anſwere*, Multiplie 8. li. by 60. and thereof commeth 480, yͤ which diuide by 28. & you ſhall finde 17.d. $\frac{1}{7}$: ſo much is 1.li. waight worth.

¶ The. viij. Chapter treateth of tares and allowances of marchaundiſe ſolde by waight.

AT 12.li. the 100. ſuttell, what ſhall 987.li. ſuttell be worth? in giuing 4.li. waight vpon euery 100 for tret? *Anſwere*, adde 4.li. vnto 100. & you ſhall haue 104. Then ſay by the rule of thre, if 104 be worth 12.li. what are 987.li. waight worth? multiply & diuide, & you ſhal finde 113. li. $\frac{23}{25}$ which is worth 17.s. 8.d. $\frac{4}{13}$. So much ſhal yͤ 987.li. waight be worth.

104. | 12. | 987.

At 6.s. 8.d. yͤ pound waight what ſhall 345.li. $\frac{1}{2}$ be worth in giuing 4.li. waight vpon euery 100. for the tret. *Anſwere*, ſee firſt by the rule of three, what the 100.pound is worth ſaying, if $\frac{1}{1}$ | 6 $\frac{2}{3}$ | $\frac{100}{1}$ Multiplie and diuide, & you ſhal finde 33.li. $\frac{1}{3}$ then adde 4.li. vnto 100.& they are 104.thẽ ſay againe by the rule of 3.if a 104.li.be ſolde for 33.li. $\frac{1}{3}$ for how much ſhall 345.li. $\frac{1}{2}$ be ſolde? multiply & diuide, and you ſhal finde 110.li. 14.s. 8.d. $\frac{12}{13}$ So much ſhal the 345.li. $\frac{1}{2}$ be worth, at 6.s. 8.d.the pound, in giuing 4.vpon the 100.

More, if 100. bee worth 36.s. 8.d. what ſhall 780.li. bee worth in rebating 4.li. vpon euery 100. for Tare & Cloſſe? *Anſwere,* Multiply 780.by 4. and therof commeth 3120.The which diuide by 100. and you ſhall haue 31.li. $\frac{1}{5}$ abate 31. $\frac{1}{3}$ from 780.and there wyll remaine 748 $\frac{4}{5}$. Then ſay by the rule of three, if $\frac{100}{1}$ do coſt 36. $\frac{2}{3}$, what will 748. $\frac{4}{5}$ coſt after the rate? Multiplie & diuide ſo ſhall you finde 274.s. 6.d. $\frac{18}{25}$, and ſo much ſhall the 780.li. coſt, in rebating 4.li. vpon euery 100. for Tare and Cloſſe.

More, whether doth he loſe more that giueth 5.li.vpō the 100. or he that rebateth 5.li.vpon the 100.for tare and cloſſe? *Anſwere.* Fyrſt, note that hee which giueth 5.li.vpon the 100.giueth 105.for 100: and he which rebateth 5.li. vpon the 100. giueth the 100. for.95. Therefore ſay by the rule of 3. if 105. be giuen for 100.for how much ſhall yͤ 100.be giuen? Multiply and diuide & you ſhal finde 95. $\frac{5}{21}$: and he which rebateth 5.vpon the 100.maketh but 95. of 100: ſo that he loſeth 5.vpon the 100. & the other which giueth 5.vpon yͤ 100 loſeth but 4.$\frac{16}{21}$ vpon the 100. Thus he yͭ rebateth 5.vpon the 100.loſeth more by $\frac{5}{21}$ vppon the 100. than the other which gaue 5.vpō the 100.for tare and cloſſe.

If 100.of Allam do coſt mee.26.s. 8.d.how ſhall I ſell the li.waight to gaine after the rate of 10. vpon yͤ 100. *Anſwere,* put 26.s. 8.d.al into pence,& you ſhal haue 320.d. Thē ſay by yͤ rule of 3.if 100.giue 110.what ſhal 320.giue, multiplie and diuide, and you ſhall finde 352.d. Thē ſay, if 100.li. be worth 352.d. what is 1.li. multiplye & diuide, and you ſhall haue 3.d. $\frac{26}{50}$ which $\frac{26}{50}$ is worth $\frac{1}{2}$, and $\frac{1}{25}$ of $\frac{1}{2}$. That is to ſaye, the pounde waight ſhalbe worth 3.d. $\frac{1}{2}$. $\frac{1}{25}$ of a halfe pennye, in gaining 10. vpon the 100.

If one pound waight doe coſt me, 6.s. 10.d. and I ſell the ſame for 7.s. 2.d. I demaund how much I ſhould gaine vpon the 100.li. of money after the rate? *Anſwere*, ſay by the rule of 3. if 6.$\frac{5}{6}$ yelde 7.$\frac{1}{6}$ what will $\frac{100}{1}$ yelde? Put the whole numbers into theyr broken, then multiplie and diuide, & you ſhal finde 104.$\frac{36}{41}$ from the which ſubſtract 100. and there reſteth 4.li.$\frac{36}{41}$ ſo much is gained vpon the hundred pounde of money after the rate.

More, if one pound do coſt me 5.s. 4.d. and I ſell the ſame againe for 4.s. 9.d. I demaunde how much I ſhal loſe vpon the 100. pounde of money? ſaye, if 5.$\frac{1}{3}$ doe giue but 4.$\frac{3}{4}$, what ſhall $\frac{100}{1}$ giue ? Put the whole number into their broken. Then multiplie and diuide & you ſhall finde 89. $\frac{1}{16}$ the which you muſt ſubſtract frõ 100. and there wyll remaine 10. li. $\frac{15}{16}$, ſo much is loſte vpon ỹ 100. li. of money.

More if the li. waight doe coſt mee 3. s. 2. d. & I ſell it againe for 4. s. 4. d. how muche ſhall I gaine vpon 20. s. *Anſwere*: ſay if 3. $\frac{1}{6}$ giue 4. $\frac{1}{3}$ what ſhal $\frac{20}{1}$ giue, Multiplie and diuide & you ſhall fynde 27. s. $\frac{7}{19}$: out of the which abate 20. s. and there will remaine 7. ſhillings. $\frac{7}{19}$, which is 4. d. $\frac{4}{19}$: and ſo muche is gained vpon the pounde of money that is to ſay vpon 20. s.

If the pounde waight doe coſte me 4. s. 4. d. and I ſell it againe for 3. s. 2. d. I demaunde howe muche I ſhall loſe vpon the pounde of money ? that is to ſaye vpon twenty ſhillings.
Anſwere: ſay, if 4. $\frac{1}{3}$ giue but 3. $\frac{1}{6}$ what wil $\frac{20}{1}$ giue, multiply & diuide & you

ſhal finde 14.s. $\frac{8}{13}$ the which you muſt abate from 20.s. ⁊ there wil remaine 5.s. $\frac{5}{13}$ which $\frac{5}{13}$, is woꝛth 4.d. $\frac{8}{13}$ of a pennye and ſo much is loſte vpon the pounde of money.

¶The. ix. Chapter treateth of certeine queſtions, done by the double rule, and alſo by yͤ rule of thꝛee compounde.

When the quarter of wheate, doth coſt 6.s. 8.d. the loafe of bꝛeade waying 20. ounces is ſolde foꝛ a ob. I demaund yͭ if yͤ quarter of wheat did coſt ten ſhillings, foꝛ how much ſhall the loafe of bꝛeade be ſolde, that wayeth 16.ounces?

Aunſwere: by the fyꝛſt part of yͤ rule, of 3. compound which is mentioned in the thirde part of thys booke, and in the ſeconde Chapter of the ſame. Therfoꝛe ſay by the ſame firſt part of yͤ rule of 3.cōpound, if $6.\frac{2}{3} \mid \frac{20}{1} \mid \frac{1}{2} \mid \frac{10}{1} \mid \frac{16}{1}$.

Then multiplye the fyꝛſt number

by the ſeconde, and the pꝛoduct therof ſhalbe your diuiſoꝛ. Likewiſe multiplie the other thꝛee numbers the one by the other, and the pꝛoduct thereof ſhalbe your diuidende: as thus, firſt multiply 6. $\frac{2}{3}$ by $\frac{20}{1}$, and thereof commeth $\frac{400}{3}$ foꝛ your diuiſoꝛ, then multiply $\frac{1}{2}$ by $\frac{10}{1}$ and the pꝛoduct therof by $\frac{16}{1}$, ſo you ſhall haue $\frac{160}{2}$ foꝛ your nũber that is to be diuided, then diuide $\frac{160}{2}$ by $\frac{400}{3}$, and thereof commeth $\frac{480}{800}$ yͤ which being abbꝛeuiated bꝛingeth $\frac{3}{5}$ of a peny: and foꝛ yͤ pꝛice muſt the loafe of bꝛead be ſolde, which wayeth 16. ounces, and the quarter of wheate being woꝛth ten ſhillings.

Oꝛ otherwiſe by the rule of 3. at two times. Firſt ſaye if $\frac{20}{1}$ ounces giue, $\frac{1}{2}$ what wyll $\frac{16}{1}$ ounces gyue? Multiplie and diuide, and you ſhall fynde $\frac{2}{5}$ of a pennye. Then ſaye againe, if 6. $\frac{2}{3}$ doe giue mee $\frac{2}{5}$, what will $\frac{10}{1}$ giue? Multiplye and diuide, and you ſhall fynde $\frac{3}{5}$ of a pennye, as afoꝛe is ſayde.

When the cariage of one hundreth wayghte of marchaundiſe 50. miles doth coſt 5 s. what ſhall the cariage of 500 waight coſte me for 16 miles? *Anſwere*, By the fyrſt part of the rule of 3 compound, ſaying if 100|50|5|500|16. Multiply 100 by 50 the product wyl be 5000, which ſhal bee your diuiſor. Then multiply 5 tymes 500 by 16 and therof commeth 40000 for your diuidend. Therfore diuide 40000 by 5000 and you ſhall finde 8 s. ſo muche ſhall coſte the carriage of 500 wayghte 16 miles.

Or otherwiſe by the double rule of three, that is to ſaye by the rule of thre at two times: firſt ſay if 50 miles do paye 5 s. what ſhall 16 miles paye? Multiply and diuide, & you ſhall find 1 s. $\frac{3}{5}$. Then ſay, agayne, if 100 waight do coſt me 1 s. $\frac{3}{5}$ what ſhal 500 wayght coſt? Multiply and diuide, and you ſhall finde 8 s. as before.

When the cariage of 100. pounde waight of Marchaundiſe 84. miles, doth coſt me ſix ſhillings, how many miles may I haue 64. pound waight caried for three.s.4.d. *Aunſwere,* by yͤ ſecond part of the rule of three compounde; ſaye if $\frac{100}{1} \mid \frac{14}{1} \mid \frac{6}{1} \mid \frac{64}{1} \mid 3\frac{1}{3}$.

Then multiplie the fourth number $\frac{64}{1}$ by the thyrde number $\frac{6}{1}$, and thereof commeth $\frac{384}{1}$ for your diuiſor. Likewiſe multiplie $3\frac{1}{3}$ by $\frac{100}{1}$, and by $\frac{84}{1}$ and you ſhall haue in the product $\frac{84000}{3}$: then diuide $\frac{84000}{3}$ by $\frac{384}{1}$ and you ſhall fynde 72. miles $\frac{11}{12}$ of a mile. So many miles ſhall yͤ 64. li. waight be caried, for three ſhillings 4.d.

Otherwiſe by the rule of three, at two times: Fyrſt ſay, if 100. waight doe coſt me 6.s. what ſhall 64. pound waight coſt? Multiplye and diuide, and you ſhall finde three ſhillings. $\frac{21}{25}$. Then ſaye, if 3. $\frac{21}{25}$ bee payed for 84. miles cariage: for howe many miles ſhall 3.s. $\frac{1}{3}$ be payed? Multiplye & diuide and you ſhall finde 72. miles. $\frac{11}{12}$.

If 100.horſes in 100.dayes do ſpende 180. quarters of otes : howe manye quarters of otes wil 350.horſes ſpend in 150. dayes ? *Anſwere* : by the fyrſte part of the rule of three compounde: multiply 180.times 350.by 150. and diuide the product by 100.times 100: and you ſhall finde 945.quarters. So many quarters of Otes will 350. horſes ſpende in 150.dayes.

Or otherwiſe by the rule of 3. at two times : fyrſt ſay, if 100.dayes doe yelde mee 180.quarters of otes : what ſhall 150. dayes yelde : multiplye and diuide, and you ſhall finde 270. quarters : then ſay againe, if 100.horſes do ſpende 270.quarters of Otes, howe many quarters of otes wyl 350.horſes ſpend ? Multiply and diuide, and you ſhall finde 945. quarters as before.

¶ The tenth Chapter treateth of the rule of Fellowſhip, wythout any time limited.

THe rule of felowſhip is thus: you muſt ſet down eche mãs ſumme of money that he laieth into company, euery one directly vnder the other, yͤ which you ſhall adde altogither, & the totall ſum of all their whole ſtocke beyng thus aſſembled, ſhalbe your common diuiſor, to the finding out of euery mans part of yͤ gaine. Then ſhall you multiplye the gaine, or the loſſe, by eche mans portion of money that he layde in, & diuide the products by the ſayde diuiſor: ſo ſhal you haue in your quotient euery mans part of the gaine, or elſe of the loſſe, if any thing be loſt.

A Rule.

¶ *Example*

1. Twoo Marchaunts haue made companye togither, the firſt laide in 500. li. The ſeconde put in 300. li. and wͭ occupying thei haue gained 64. li. I demaunde how much eche mã ſhal haue of the ſame gaines according to the money that he laide in. *Annſwere*: Adde 500. & 300. both togither, which

are the percels that they laide in, and therof commeth 800. for your diuiſor: then ſay by the rule of three, if 800. li. (which is their ſtock) do gaine 64. li. what ſhal 500. li. gaine? (which is the fyrſt mans money that hee laied in) multiplie & diuide and you ſhall finde 40. li. for the firſte mans parte of the gaine: then ſay if 800. giue 64. what will 300. giue? Multiplye and diuide, and you ſhal finde 24. li. for yͤ ſeconde mans part of the gaine.

500
300 | 800 | 64 | 500.
800
800 | 64 | 300.

Or otherwiſe, put 500. Li. which is the fyrſt mans money yͭ hee layed in, ouer the 800. Li. which is the whole, ſtocke, and you ſhall haue $\frac{500}{800}$ which being abbreuiated, do make $\frac{5}{8}$, & ſuch part of the gaine ſhal yͤ fyrſt mā take, yͭ is to ſay $\frac{5}{8}$ of 64. Li. which is 40. Li.

And conſequentlye, by the ſame maner, the ſeconde ſhal take the $\frac{3}{8}$ of 64. which is 24. pound for his part of the gaine as before.

$\frac{5\,|\,00}{8\,|\,00}$ | $\frac{3\,|\,00}{8\,|\,00}$

2. Two Marchaunts haue companied togither, yͤ fyrſt put in 640. li. and he taketh $\frac{5}{8}$ partes of the gaine. I demaunde what the ſeconde Marchaunt layed in? *Aunſwere*, Seing that the fyrſt Marchaunt taketh $\frac{5}{8}$ of the gaine, it followeth that yͤ ſeconde muſt haue $\frac{3}{8}$ which is the reſt, & therfore ſay by the rule of three, if $\frac{5}{8}$ of the gaine, which the fyrſte man taketh, did lay into the ſtock $\frac{640}{1}$. How much ſhall the $\frac{3}{8}$ of the gaine laye in, which is the ſeconde mans gaine? Multiply and diuide, & you ſhall find 384. li. ſo much ought the ſecond man to lay into company.

3. Two Marchauntes haue com-

panied togither, the fyrſt man layed in 640.li. and ẏ ſeconde hath layed in ſo much, that he muſt haue 60.li. for his part of 100.li. which thei haue gained. I demaunde howe much the ſeconde man did laye into companye?

Aunſwere: ſeing that the ſecond man taketh 60.li. of the gaine, it followeth ẏ the fyrſt muſt haue but 40.pounde. Therefore ſay by the rule of thrée, if 40.li. do lay in 640.li. what ſhal 60.li lay in? Multiply and diuide, and you ſhall finde 960. pounde, ſo much did the ſeconde marchaunt lay in.

4. Two marchaunts haue companied togither, the firſt laide in 83.li. 6.s.8.d. ẏ ſeconde put in 170.duckets: & thei haue gained 100.li. of the which the fyrſt man muſte haue 60.li. I demaund what the ducket was worth? *Anſwere*, ſeing that the firſt mã muſt haue 60.li. it followeth ẏ the ſeconde muſt haue 40.li. therefore ſay by the rule of thre if 60.li. of gaine ẏ the firſt

man taketh did lay in 83.li. 6.s. 8.d. of principall, howe much ſhall 40.li. of gaine put in, multiplye & diuide, and ſhall find 55.li. $\frac{5}{9}$: ſo much are the 170. duckets worth. Then put 55.li. $\frac{5}{9}$ into ſhillings, and you ſhall haue 1111.s. $\frac{1}{9}$ thē to know what ẏ ducket is worth, ſaye by the rule of three, if a $\frac{170}{1}$ geue 1111. $\frac{1}{9}$, what will $\frac{1}{1}$ giue? Multiplye and diuide, & you ſhall fynde 6.s. 6.d. $\frac{22}{51}$, ſo much is the ducket worth.

5. Two Marchauntes haue companied togither, the ſeconde mā laide in more by 30.li. than did the firſt mā: and they gained 120.li. of the which ẏ firſt man ought to haue 50.li. I demaund what eche of them did lay in. *Anſwere*, from 120.li. abate 50.li. and there reſteth 70.li. for ẏ ſecond mans part: ſo that by this meanes ẏ ſeconde mā (bicauſe he laide in 30.li. more thā the firſt man did) taketh 20.li. more of ẏ gaine: & therfore ſay by ẏ rule of 3. if 20.li. of gaine did lay in 30.li. of principall, how much ſhall 50.li. lay in?

Multi-

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Multiplye and diuide , and you ſhall finde 75.li. ſo much did the firſte man lay in, and conſequentlye the ſeconde layd in 105 li.

6. Two marchaunts haue companied togither, the ſecond hath layd in twiſe ſo muche as the firſte man dyd , and 10 li. more: and they gayned 100 li. of the which, the firſte ought to haue 32 li. for his part: I demaũd how much eche of them dyd lay into company?

Anſwere, If it were not for the 10 li. that the ſecond man layd in more : he ſhould haue had but 64 li. of the gain which is the double of the firſt mans parte . But bicauſe he layd in 10 li. more, hee hath foure pounde more of the gayne, and therefore ſaye by the rule of three , if 4 li. of gayne did laye in 10 li. of principall, (which was ouer and aboue the double of the firſt mãnes laying in) what ſhall 32 li. of gaynes lay in? which is the firſte mannes parte of the gaynes that hee taketh.

Multiplye and diuide, and you ſhall finde 80 li. for the firſt mannes laying in: and conſequently 170 li. for the ſecond mans portion that he layed in.

7. Two marchaunts haue companied togither, and they haue gayned 100 li. of the which the firſt muſt haue after the rate of 10 vpon the 100 li. and the ſecond muſt haue after the rate of 15 li. vpon the 100 li. I demaunde how muche eche of them oughte to haue? *Aunſwere,* Put 10 li. for the fyrſt mans laying in, and 15 li. for the ſecond mānes laying in. Adde 10 li. and 15 li. togither, and they make 25 li. Then put 10 ouer 25. and it is $\frac{10}{25}$ which being abbreuiated are $\frac{2}{5}$. Therfore he that taketh 10 li. vpon the 100 li. muſt haue the $\frac{2}{5}$ of the gayne, which is 40 li. Then put 15 ouer 25. and it is $\frac{15}{25}$ which being abbreuiated are $\frac{3}{5}$. Therefore the ſecond muſt haue $\frac{3}{5}$ of the 100 li. which is 60 li.

8. Two Marchauntes haue com-

panied togither, yͤ fyrſt laide in 46.li. 18.s. and the ſeconde laide in 33.li.2.s. ſo they haue gained 30.li. I demaund how much euery man ſhall haue for his part of the gaine? *Anſwere*: Adde 46.li. 18.s. and 33.li.2.s. both togither and you ſhall finde 80.li. for your cōmon diuiſor: then ſay if 80.li. which is all their ſtocke do gaine 30.li. what will 46.$\frac{9}{10}$ gaine, which is the fyrſte mans laying in: Multiplie & diuide, and you ſhall finde 17.li. 11.s. 9.d. for the firſt mans part of the gaine. Thē ſay again, if 80.li. do gaine 30.li. what will 33.li. $\frac{1}{10}$ gaine, which was the ſeconde mans, laying in: multiply and diuide, and you ſhall fynde 12.li. 8.s. 3.d. for the ſeconde mans part of the gaine.

And after the ſame maner ſhall you doe, in caſe there were three or foure Marchaunts that would companye togither: Adding all theyre ſummes of money (which they laye into the ſtock) into one total ſumme:

which ſhalbe your common Diuiſor: and then worke with the reſt, as is taught in the former Queſtions of yͤ rule of companie.

9. Three Marchaunts haue companied togither, the firſt laide in I know not how much: the ſeconde did put in 20. pæces of cloth, and yͤ thirde hath layde 500. pounde. So at yͤ ende of their cōpany, their gaines amounted vnto a thouſand pounde, whereof yͤ fyrſt man ought to haue 350. pound, and the ſeconde muſt haue foure hūdred pounde.

Now I demaunde how much the firſt mā did lay in, and for how much the 20. pæces of clothe were put into company?

Aunſwere.

Seeing that the fyrſte and the ſeconde marchaunts muſt haue 750. li. for their parts of the gaine. Then the thirde man muſt haue the reſt of the thouſande pound which is 250. li.

And therefore ſay by the rule of thre, if 250. of gaine, be come of 500.li.of principall: of howe much ſhall come 350.li.of gaine? which the fyrſt man taketh, multiplye and diuide and you ſhall finde 700.li. So muche did the firſt man laye in: then ſay if 250.li.of gaine be come of 500.li. principall, of howe much will come 400.li. which is the gaine yͭ the ſeconde mã taketh. Multiply and diuide, & you ſhal finde 800.li. For ſo much were yͤ 20.peeces of cloth layde into company.

10. Three Marchaunts haue gained 100.li. the fyrſt muſte haue the $\frac{1}{2}$, the ſeconde muſt haue $\frac{1}{3}$: And yͤ third muſt haue $\frac{1}{4}$. I demaund how much euerye man muſt haue of the gaine? *Aunſwere,* Reduce $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, into a cõmon denominatiõ, after the order of the ſecond reduction in fractions, & you ſhall finde $\frac{12}{24}$, for the $\frac{1}{2}$: $\frac{8}{24}$, for the $\frac{1}{3}$: and $\frac{6}{24}$, for the $\frac{1}{4}$: Then take 12 for yͤ firſt mans laying in, 8. for yͤ ſeconde

cond mannes laying in: and 6 for the thirde mannes laying in. The which three numbers being added together ſhall be your common diuiſor, which do make 26. Then multiply 100 by 12, for the firſte man, by 8 for the ſecond man, and by 6 for the third man. And diuide euery multiplication by 26. So ſhall you finde 46 li. $\frac{2}{13}$ for the fyrſte mannes part of the gaine. 30. li. $\frac{10}{13}$ for the ſecond mannes parte: and 23 li. $\frac{1}{13}$, for the third mannes parte.

11. Two marchaunts haue gayned 100 li. the firſte muſte haue $\frac{1}{2}$ and 5 li. more: the ſecond muſt haue $\frac{1}{3}$ and 4 li more: I demaunde how muche eche of them ſhall haue? *Aunſwere,* From 100 abate 5 and 4. ſo ther wil remayn 91. then take the $\frac{1}{2}$ of 100. li. which is 50 li. for the firſt mans laying in: Likewyſe, take $\frac{1}{3}$ of 100 li. for the ſeconde mans laying in, which is 33 li. $\frac{1}{3}$. Then adde 50 li. and 33 li. $\frac{1}{3}$ togither, and you ſhall haue 83 li. $\frac{1}{3}$ for youre com-

mon diuiſor, then multiply 91. pound by 50. and diuide by 83. $\frac{1}{3}$: and thereof cōmeth 54. pound, $\frac{3}{5}$ vnto the which number adde 5, and all is 59. li. $\frac{3}{5}$ for yᵉ firſt mans part. Likewyſe multiplye. 91. by 33. $\frac{1}{3}$: and diuide by 83. $\frac{1}{3}$, & you ſhal finde 36. li. $\frac{2}{5}$ vnto the which adde 4 : and you ſhal haue fourty pound, $\frac{2}{5}$ for the ſeconde mans part.

12. Two Marchauntes haue gained a hundred pound, the firſt muſte haue the $\frac{1}{2}$ leſſe by 4. poūd, the ſecond muſt haue $\frac{1}{3}$: leſſe by 2. pounde. I demaund how much eche of them ſhall haue? *Aunſwere*, Adde 4. & 2. vͦ 100. & they make 106. Then take as before is ſaide 50. pounde, for the firſt man, & 33. $\frac{1}{3}$ for the ſeconde, adde them bothe togither, and they be 83. which ſhalbe your diuiſor. Then multiplie 106. by 50. and diuide the product by 83. $\frac{1}{3}$, ſo thereof commeth 63. li. $\frac{3}{5}$. From the which abate the foure pounde leſſe yᵗ the fyrſt mā taketh, and then is there remaining 59. pound, $\frac{3}{5}$ for hys parte.

Likewiſe multiplie 106. by 33.$\frac{1}{3}$ and diuide by 83$\frac{1}{3}$ & you ſhall finde 42.li. $\frac{2}{5}$: from the which abate 2.li.leſſe and there remaineth 40.pounde, $\frac{2}{5}$ for the ſeconde mans part.

¶*The Rule of Felowſhip with time.*

THe money that euerymã laieth in, muſt be multiplied by the time that it remaineth in company: and of that which commeth therof you ſhal make their new layings in for eche of them: and then multiplye the gaines by euery one of them ſeuerally, the which you ſhall diuide by all their new layings in added togither, and you ſhall haue proporcionally eche mans part of the gaine according to his laying in.

¶*Example.*

1. Two Marchaunts haue companied togither, the firſt hath put in the fyrſt of January 450. pounde, the ſecond did lay in yͤ 2.of May.750.pound

And at the yeres ende, they had gayned 100 li. I demaunde howe muche eche of them ſhall haue of the gayne? *Anſwere*: foraſmuche as the firſte dyd put 450 li. the fyrſte of January: hys money remained in company 12. monethes, and therefore multiply 450. by 12 monethes, and therof commeth 5400. for his newe laying in. And the ſeconde layed in his 750 li. but at the firſt daye of Maye: ſo that his money remayned in companye but 8 monethes. Therefore multiplye his 750 li. by 8. and therof commeth 6000 for hys new laying in: Then adde 5400. with 6000. and they make 11400 for youre common diuiſor: Then multiply 100 li. which is the gaynes by 5400, and diuide the product by 11400. and therof commeth 48 li. $\frac{7}{19}$ for the firſt mannes part of the gayne. Likewiſe multiplye 100. by 6000, and diuide the producte by 11400. and you ſhal finde 52 $\frac{12}{19}$ & ſo much muſt the ſecond man haue for his parte of the gayne.

2. Two marchaunts haue companied togither, the firſt hath put in the firſt of January 640. li. The ſeconde can lay in nothing vntil the firſt of Aprill. I demaunde how much he ſhall then laye in, to the ende that he maye take halfe the gaynes: *Anſwere*, Multiply 640 li. by 12. monethes that his money abideth in the companye, and therof cōmeth 7680 li. for his laying in. And ſo muche oughte the ſeconde mannes laying in to be, for bycauſe he taketh $\frac{1}{2}$ of the gaine: But for that, that he putteth in nothing vntill the firſt of Aprill, his money can be in cōpany no lōger than 9 monethes. And therefore diuide 8680 by 9, and therof commeth 753 li. $\frac{1}{3}$ So much ought the ſeconde marchaunt to laye in the firſt of Aprill, to the ende that he may take the one moyty of the gaynes.

3. Three Marchauntes haue companied togither, the firſte layed in the firſte of Marche 100 li. The ſe-

conde laide in yͤ firſt of June ſo much money, that of the gaine, hee muſt haue the $\frac{1}{3}$ parte: and the thirde laide in yͤ fyrſt of Nouember ſo much money, that of the gaines he muſt haue likewiſe $\frac{1}{3}$ and thei continued in company, vntil yͤ next Marche folowing. I demaunde howe much the ſeconde and the thirde Marchaunts did laye in? *Anſwere*, Multiply 100, which the firſte man did lay in, by 12. monethes that his money continued in companie, and therof commeth 1200. for hys laying in: and ſo much ought the ſeconde and the thirde marchaunt eche of them to lay in: Bicauſe they parte the gaynes by thyrdes. But for that, that the ſeconde Marchaunt putteth in nothing tyll the fyrſt of June, hys money can bee in companye but nine monethes. Therefore diuide 1200, by nine monethes, and therof commeth 133. $\frac{1}{3}$. And ſo much ought the ſeconde Marchaunt to laye in: Then, foraſmuch as the thirde Marchaunt, dyd laye in nothing vntil the fyrſt of Nouember: His money abideth in companye but the ſpace of foure monethes. Therefore diuide 1200. by 4. and thereof commeth three hundred pounde. And ſo much ought the third marchaunt to lay into companye.

4. Three marchauntes haue companied togither, the fyrſte layde in the fyrſt of January a hundred Duckettes. The ſeconde hath layed in fyftie pounde, the fyrſte of Marche: And the thyrde put in a Jewell the fyrſte of Julye: And at the yeares ende, they had gained foure hundred crownes: of the which, the fyrſte marchaunt muſt haue fifty crownes, and the ſeconde muſte haue 80. I demaunde what yͤ Ducket was worth, and at what price the Jewell was valued, whych the thyrde Marchaũt layde in?

Aunſwere: the firſte mannes money is 1200 as afore is ſayde, and hee taketh 50 crownes of the gayne: therefore ſay, if fifty crownes of gayne be come of 1200, which was his ſtock, of how muche ſhal come 80. crownes of gaine that the ſeconde man taketh? multiplye and diuide, and you ſhall finde 1920. for the ſecond marchaunts laying in. Then ſay again, if 50 crownes bee come of 1200. ſtocke: of howe much ſhal come 270. crownes, which the thirde man taketh of the gayne? Multiply and diuide, & you ſhall finde 6480. for the third marchauntes laying in. Then diuide 1920, whiche is the ſeconde mannes laying in, by 10. monethes that his money did continue in company, and you ſhall finde 192 Duckets, which are worth 50. li. bicauſe he layed in 50 li. Then diuide 192 Duckets by the ſayde 50. li. (being reduced into ſhillinges) and thereof commeth 5. ſhillings 2. pence, $\frac{1}{2}$. So muche was the Ducket worth: Finally, nallye, diuide 6480. (which is the third mannes laying in) by 6. monethes that his Jewell remained in cõpanye, and you ſhall finde 1080 Duckets: and for that price was yͤ Jewell put into company.

5. Three Marchauntes haue companied togither: the firſt layed in the firſt of January 100 li. and the firſte of Aprill he hath taken backe againe 20. li. The ſecond hath layed in the firſte of Marche 60 li. and afterward he dyd put in more 100 li. the firſt of Auguſt. The third layd in the firſt of July 150 li. And the firſt of October he did take backe agayne 50 li. And at the yeres end, they found that they had gained 160 li. I demaunde how muche euery man ſhall haue? *Anſwere,* Multiply 100 li. which the firſt man layed, by 12 monethes, and therof commeth 1200. li. from that number abate 9 times 20 which are 180. and there wil remaine 1020. for the firſt mans laying in. Thẽ multplie

multiplie 60. which the ſeconde man layde in, by ten & you ſhall haue 600. vnto the which adde 5. times one hũdred, which are 500. ſo all amounteth to 1100. for the ſecond mans laying in: Afterwardes, multiplie 150. pounde, which the thirde man hath layed in, by 6. monethes, and therof commeth 900. from yͤ which number abate thre times 50. and they are 150: ſo there reſteth 750. for the thirde mans laying in. Then procede with the reſte, as in the firſt Queſtion of the rule of felowſhip with tyme, in adding 1020, 1100. and 750. altogither, which ſhall be your Diuiſor: Then multiply 160 by 1020. by 1100. and by 750, & diuide at euery time by your Diuiſor, which is by all theyr layings in added togither, and they make 2870, ſo you ſhall fynde $56.\frac{248}{287}$: for the fyrſt man, $61.\frac{93}{287}$ for the ſeconde, and $41.\frac{233}{287}$ for the thirde man.

6. Two Marchaunts haue compa-

nied togither, the firſte hath put in 960.pounde, for the ſpace of 12. monthes, and he ought to haue 8.pounde vpon the hundred pounde of yͤ gaine. The ſeconde hath layed in 1120.li. for yͤ ſpace of eight monethes, & he ought to haue after 12.pounde vpon the 100. pound of the gaine.

And at the yeres ende, they haue gained eyght hundred pounde. I demaunde how much eche of them ſhal haue of the gaine. *Anſwere,* multiplie 960. that the firſt mā did lay in, by 12. monethes, and the product thereof, multiplie againe by 8. and you ſhall haue 92160. for the fyrſt mans laying in: then multiplye the 1120. that the ſecond hath layed in by eyght monethes, and that which commeth therof you ſhall multiplie againe by 12. and you ſhall finde 107520. for the ſeconde mans laying in: Then procæde with the reſt, as in the firſt Queſtion of the Rule of Felowſhippe, and as in the laſte Exaumple, and you ſhall finde 399 $\frac{3}{11}$ for the firſt man: and 430. li. $\frac{10}{11}$ for the ſecond man.

¶ The rule of company, betwene Marchaunts and their Factours.

7. The eſtimation of the bodye or perſone of a Factour, is in ſuche proportion to the ſtocke, which the Marchaunt layeth in: as the gayne of the ſayd Factour is vnto the gayne of the ſayd Marchaunt. As thus: if a Marchaunt do put into the handes of hys Factour 200 li. to employe, and he to haue halfe the profite, the perſone of the ſayd Factour ſhal be eſtæmed 200 li, And if the Factour do take but the $\frac{1}{3}$ of the gaine, he ſhould haue but $\frac{1}{2}$ ſo much of the gaine as the Marchaunt taketh, which ſhould take $\frac{2}{3}$ wherfore the perſone of the Factour is eſtemed but the $\frac{1}{2}$ of that which the Marchant layeth in, that is to ſay 100 li.

And if the Factour did take the $\frac{2}{5}$ of the gayne, then the Marchaunt ſhall take the reſidue, which are $\frac{3}{5}$ of yͤ gain wherefore the gayne of the Mayſter vnto that of the Factoure is in ſuche proportion as 3 vnto 2. Then if you will knowe the eſtimation of the perſone of the Factour, ſay if 3 giue me 2 what wil 200 giue? Multiplie 200 by 2 and diuide by 3 ſo you ſhall finde 133 $\frac{1}{3}$ Otherwiſe, conſider that the Factoure taketh the $\frac{2}{3}$ of that whiche the Marchaunte taketh. And therefore take the $\frac{2}{3}$ of 200, and you ſhall fynde 133 $\frac{1}{3}$ as before: and ſo much is the perſone of the Factoure eſteemed to bee worth.

8. And if the Marchaunt ſhould deliuer vnto his Factoure 200. li. and the Factour would laye in 40 li. and his perſon, to the ende he might haue the halfe of the gain: I demaund for how much ſhal his perſon be eſtemed *Anſ.* abate 40 li. from 200 li. and ther

wyll

will remaine 160.li. And at ſo much ſhall his perſon be eſtemed.

And if the factour woulde take the $\frac{2}{3}$ of the gaine, his perſon with his 40 pounde, ſhall bee eſtemed twiſe as much as the ſtock that the marchant layeth in, which ſhoulde haue but $\frac{1}{3}$ of the gaine: for $\frac{2}{3}$ vnto $\frac{1}{3}$, is in double proportion. Therefore double two hundred pounde, therof cōmeth 400. li. from the which abate 40.li. & there will remaine 360. li. And if the Factour would take but the $\frac{1}{3}$ of yͤ gaine, that ſhall bee but the $\frac{1}{2}$ of $\frac{2}{3}$ which the marchaunt taketh: then the eſtimation of his perſon, with his laying in ſhould be eſtemed but the halfe of yͭ which the marchaunt layeth in: take therfore the $\frac{1}{2}$ of 200.li. which is 100.li. from the which abate fourty pounde, and the reſt which is 60.li. is the eſtimation of his perſon.

9. If it ſo chaunce that for to make traffick of 240.li. the perſon of yͤ factour ſhould be ſo eſtemed, yͭ he ſhuld

haue but the $\frac{1}{4}$ of the gaine, & yet hee would haue the $\frac{2}{3}$, I demaunde how much he ſhoulde put in of ready money, beſides hys perſon: *Aunſwere*, ſeing that his perſon gaineth the $\frac{1}{4}$, al the whole laying in, ſhall gaine the reſt that is to ſaye the $\frac{3}{4}$: nowe for bicauſe $\frac{1}{4}$ is the $\frac{1}{3}$ of $\frac{3}{4}$ therfore his perſon ſhalbe eſtemed the $\frac{1}{3}$ of all the laying in. Take then the $\frac{1}{3}$ of 240. and you ſhall haue 80. for the eſtimation of his perſon, and for that, that he wil haue the halfe of yͤ gaine, you ſhal adde 80. with 240. li. and therof commeth 320. of the which take the halfe, which is 160. and from the ſame you ſhal abate the 80. and there wyll remaine other 80. which he ought to lay in of readye money, and the marchaunt muſt lay in the ouerplus, which amounteth to 160. li.

10. A marchaunt hath deliuered to his Factour 1200. li. to gouerne them in the trade of Marchãdiſe vpon ſuch condition that hee for hys ſeruice

ſhall

ſhal haue the $\frac{1}{3}$ of yͤ gaine if any thing be gayned, oꝛ of the loſſe if any thing be loſt: J demaund foꝛ how much hys perſon was eſtemed? *Anſwere*, ſæing that the Factoure taketh the $\frac{1}{3}$ of the gain, hys perſone ought to bæ eſtæmed as muche as $\frac{1}{2}$ of the ſtock which the Marchaunte layeth in, that is to ſay the $\frac{1}{2}$ of 1200 li. which is 600 li. The reaſon is, bycauſe the $\frac{1}{3}$ of the gayne that the Factoure taketh, is the $\frac{1}{2}$ of the $\frac{2}{3}$ of the gaine that the Marchaunt taketh.

11. A Marchaunt hath deliuered vnto his Factour 1200 li. and yͤ Factour layeth in 500 li. and his perſon: Now, bicauſe he laieth in 500 li. and his perſone, it is agræd betwene them that he ſhal take the $\frac{2}{5}$ of yͤ gayn: J demaũd foꝛ how much his perſone was eſtæmed? *Aunſwere*, Foꝛaſmuch as the Factour taketh the $\frac{2}{5}$ of the gaine, he taketh the $\frac{2}{3}$ of that which yͤ Marchãt taketh, foꝛ $\frac{2}{5}$ are the $\frac{2}{3}$ of $\frac{3}{5}$; and there-

foꝛe the Factours laying in ought to be 800.pounde, which is the $\frac{2}{3}$ of 1200. pound, that the marchaunt layed in: Then abate 500. pounde, which the Factour did lay in, from 800.pounde, which ſhould be hys whole ſtock and there remaineth thꝛe hundꝛed poũde foꝛ the eſtimation of hys perſon.

12. Moꝛe, a marchaunt hath deliuered vnto his factour a thouſand poũd vpon ſuch conditiõ, that the Factour foꝛ hys paines and ſeruice, ſhall haue the gaines of 200.pounde, as though he layde ſo much in of ready money: I demaunde what poꝛtion of yͤ gain, the ſaide Factour ſhal take? *Anſwere*; See what parte the 200.li. (which the Factour layed in) is of 1200. which is the whole ſtocke of their company, & you ſhall finde that it is the $\frac{1}{6}$, and ſuch parte of the gaine ſhall the Factour take.

But in caſe, that in making the couenauntes, it were agreed that the

Factour ſhoulde haue the gaine of two hundred pound of yͤ ſtock, which the marchant layeth in, that is to ſay, of the thouſand pound. Then ſhould yͤ Factour take the $\frac{1}{5}$ part of yͤ gaine. For 200. li. is the $\frac{1}{5}$ of a 1000. pounde.

¶ The xj. Chapter treateth of the Rules of barter.

I. Two Marchants wil chaũge their marchandiſe, the one wͭ the other. The one of them hath cloth of 7. s. 1. d. yͤ yarde to ſell for ready money, but in barter he will ſell it for 8. s. 4. d. The other hath Sinamon of 4. s. 7. d. yͤ li. to ſell for ready money. I demaund how he ſhall ſell it in barter to the ende he be no loſer? *Anſwere*, ſay, if 7. $\frac{1}{12}$ (which is yͤ price yͭ the yard of cloth is worth in redy money) be ſolde in barter for 8. $\frac{1}{3}$ for what ſhal 4. $\frac{7}{12}$ be ſolde in barter which 4. $\frac{7}{12}$, is the price yͭ the li. of Synamon is worth in ready money, reduce the whole numbers into their brokē, brokẽ, and then multiply and diuide, and you ſhall finde 5.s.4.d. $\frac{12}{17}$ parts, of a peny, and for ſo much ſhall he ſell the pounde of Synamon in barter.

2. Two Marchaunts wil chaunge their marchaundiſe the one with the other, the one of them hath Chaumlets of two pounde 18.s.4.d. the peece to ſell for ready money, and in barter he wyll ſell the peece for 4.li.3.s.4.d. the other hath fine capps of 35.s.10.d. yͤ doſſen to ſell in barter. I demaund what yͤ doſſen of caps did coſt in redy money? *Anſwere*, ſay if 4.li.3.s.4.d. which is the ouerprice of the peece of Chamlet, become of 2.li.18.s.4.d. which was the iuſt price of the ſame, of what ſhall come 35.s.10.d. which is the ouerprice of the doſſen of cappes? Multiply and diuide, & you ſhall finde 25.s.1.d. and ſo much are the doſſen of capps worth in redy money.

3. Two Marchaunts wil chaunge their marchaundiſe the one with the other; yͤ one of them hath Fuſtians

of 18.s. 4.d. the pece to ſell for readye money, and in barter hee will ſell the peece for 26.s. 8.d. The other hath tapiſtry of 15.d. the ell to ſell for readie money, and in barter hee wyll ſell it for 20.d. the ell: I demaunde which of them gaineth, and how much vpõ the hundred pounde of money?

Aunſwere: ſaye if 18.s. $\frac{1}{3}$ (which is the iuſt price of the peece of Fuſtian) bee ſolde in barter for 26.s. $\frac{2}{3}$: for howe much ſhall 1.s. $\frac{1}{4}$ (which is the iuſte price of the ell of tapiſtry) bee ſolde in barter? Multiplie and diuide, & you ſhal finde 21.d. $\frac{9}{11}$. And he doth ouerſel it but for 20.d. ſo that of 21.d. $\frac{9}{11}$: he maketh but 20.d. And therefore ſaye by the rule of three, if the ſeconde marchaunt, of 21 $\frac{9}{11}$, do make but $\frac{20}{1}$ how much ſhall he loſe vpon the $\frac{100}{1}$? Multiplie and diuide, and you ſhall finde 91. $\frac{2}{3}$, yͤ which being abated frõ a hũdred there wil remaine 8. $\frac{1}{3}$. And after yͤ rate of 8. $\frac{1}{3}$. doth yͤ ſecõde marchãt loſe vpõ yͤ 100. And conſequẽtly, the firſt marchaunt, of 20.d. maketh 21.d. $\frac{9}{11}$: and therefore ſaye againe by yͤ rule of three, if the firſt marchaunt of $\frac{20}{11}$, do make 21. $\frac{9}{11}$ how much ſhall he gaine vpon $\frac{100}{1}$? Multiplie and diuide, and you ſhall finde 109. li. $\frac{1}{11}$. Thus the fyrſt gaineth after the rate of 9.li. $\frac{1}{11}$: vpon the hundred pounde of money.

For your better vnderſtanding of theſe Queſtions, you muſt note that when one marchaunt gaineth of an other after the rate of ten pound vpō yͤ hundred pound he gaineth the $\frac{1}{10}$ of his owne principall, and the other which loſeth after the rate of 9. $\frac{1}{11}$ vpon the hundred he loſeth the $\frac{1}{11}$ of his principal. And it may be proued thus: When one marchaunt will ſell hys wares vnto another, which wares ſtande him but in 100.li. & hee will ſell them for 110.li. he, of his 100.li. maketh 110.li. wherfore hee gaineth after 10.li. vpon the 100. which is the $\frac{1}{10}$ of hys principall, and the other which byeth wares for 110.li.that coſt but 110.poūd of the 110.pound he maketh but 100.li. And therefore ſay by the rule of thre, if 110. become of 100. of howe much ſhall come 100? Multiplie and diuide, and you ſhall finde 90. $\frac{10}{11}$, the which abate from 100: and there reſteth 9. $\frac{1}{11}$ is the $\frac{1}{11}$ of hys principal that the ſeconde loſeth vpon the 100. as afore is ſaide. And therefore, who ſo that wil know what one Marchāt gaineth of another, either after the rate of tenne vpon the hundred, which is the $\frac{1}{10}$ of of hys principall, or elſe after the rate of twenty vpon the hundred which is the $\frac{1}{5}$, or of any other parte, and that he would likewiſe knowe what part the other loſeth of hys principall: hee muſt take for the numeratour of the broken number of hym that loſeth, as much as for him that gaineth, thē adde the numerator and the denominator (of the broken number of hym that gaineth) both togither, & make thereof the denominator of the brokē number of him ỷ loſeth, & then ſhall you haue the part of him that loſeth, as by exaumple, of him that gayneth after ten.li. vpon the 100.li. which is the $\frac{1}{10}$ of hys principall: take the numeratour which is 1. and make that the numerator of the broken number of him that loſeth, then adde 1. which is ỷ numerator of the fraction of him that gaineth with ten, whych is hys denominator, & you ſhall haue 11.for the denominatour of the fraction of him that loſeth. Then put one ouer the 11.and ſo you ſhal haue $\frac{1}{11}$. Thus it appereth when one marchant gaineth of another after ten vppon the hūdred, he gaineth the $\frac{1}{10}$ of his principall, and the other loſeth 9.$\frac{1}{11}$ which is the $\frac{1}{11}$ of his principall. And yf hee would gaine after 20. vpon the hundred which is the $\frac{1}{5}$ of hys principall, the other ſhoulde loſe 16.$\frac{2}{5}$ which is the $\frac{1}{6}$ of hys principall, and ſo is to bee vnderſtande of all other fractions.

4. Two marchaunts wil chaunge their marchaundiſe the one with the other, the one of them hath Seies of 20.s.& 10.d. the peece, to ſell for readye money, and in barter he will ſell the peece for 23.s.4.d. & yet hee will gaine moreouer after ten pounde vpon the hundred pound. The other hath woll of 50.s. the hundred to ſell for readye money. I demaund how hee ſhall ſell the C. of woll in barter? *Aunſwere*, ſay if 20.s. 10.d. which is the iuſt price of the peece of Sey, be ſolde in barter for 23.s.4.d. for how much ſhall 50.s. (which is yͤ iuſt price of yͤ C. of woll) be ſolde in barter? Multiplie & diuide, & you ſhal finde 56.s. Thē for bicauſe the firſt marchant gaineth after 10.li. vpon the C.li. he maketh of his C.li. 10.li. & conſequently the ſeconde marchaunt maketh of 110.li. but 100.li. And therfore ſay, if the ſeconde marchaunt of 110. doe make but 100. how much ſhall he make of 56? Multiplie & diuide, & you ſhal find 50.s.10.d. $\frac{10}{11}$ of a peny,

a peny, and for ſo much ſhall he ſell yͤ hundred of woll in barter.

5. More, two Marchauntes wyll chaunge their marchaundiſe, the one with the other, the one of them hath Taffeta, of 16. crownes the peece to ſell for redie money, and in barter he will ſell the peece for twẽty crownes, and yet he wyl gaine moreouer after ten pounde, vpon the hundred poũd. The other hath ginger of 3.s. 9.d. the pounde waight, to ſel in barter. I demaunde what the pounde dyd coſte in readye money? *Aunſwere*: ſaye if twẽty crownes which is the ſurprice of the peece of Taffata, become of 16. crownes the iuſte price, of how much ſhall come. 3.s. 9.d. which is the price of the ouerſelling the pound of Ginger? Multiply & diuide, and you ſhall finde 3.s. Then, for bicauſe that the Marchaunt of Taffeta wil gayne after the rate of ten vpon the hundred: ſay if 100. doe giue 110. what ſhall 3.s. giue? Multiplye and diuide, and you

ſhall finde 3.s. 3.d. $\frac{3}{5}$ and ſo much dyd the pounde of Gynger coſt in readye money.

6. More, two marchaunts wyll chaunge their marchaundiſe the one with the other, the one of them hath Worſteds of 25.s. the peece to ſell for ready money, and in barter, hee wyll ſell the peece for 33.s. 4.d. and yet hee loſeth after ten vpon the hundred: the other hath ware of 3.li. 6.s. 8.d. the hundred to ſell for readye money. I would know howe he ſhould ſell hys ware in barter: *Aunſwere*: ſay if 25.s. which is the iuſte price of the peece of Worſted bee ſolde in barter for 33.s. 4.d. for how much ſhall three pounds 6.s. 8.d. be ſolde, which is the iuſte price of the hundred of ware. Multiplie and diuide, and you ſhall fynde 4.li. $\frac{4}{9}$ which is 8.s. ten pence, $\frac{2}{3}$ then for bycauſe that the Marchaunt of Worſteds, loſeth after ten vpon the hundred: Of a hundred hee maketh

but 90. And therefore, ſaye: If 90. giue 100. what giueth 4. pounde. $\frac{4}{9}$? Multiplie and diuide, and you ſhall fynde 4. $\frac{76}{81}$ which is worthe 18.s.9.d. $\frac{5}{27}$, and for ſo much ſhall he ſell yͤ 100. of Ware in barter.

7. More, two Marchaunts wyll chaunge their marchaundiſe the one wyth the other, the one of them hath Worſteds of 5.pounde 6.ſhillinges, eight pence the pæce to ſell for ready money, and in barter he will ſell the pæce for 6.pounde, 13. ſhillings. 4.d. and yet he loſeth after ten vppon the hundred, and the other hath Muſke of two ſhillings, nine pence $\frac{1}{3}$, the poũd waight, to ſell in barter? I demaũde what the pound did coſt in ready money? *Anſwere*: ſay if 6.pound. $\frac{2}{3}$ which is the ouerprice of the pæce of Worſted, become of 5.pound, $\frac{1}{3}$ which is yͤ iuſte price of the ſame, of how much ſhall come two ſhillings 9.pence. $\frac{1}{3}$.

Multiplie and diuide, & you ſhal finde 2. $\frac{2}{9}$ which is 2.d. $\frac{2}{3}$ then for bicauſe yͤ the marchaunt of Worſteds loſeth after ten vpon the hundred, of a hundred he maketh but 90. and therefore ſay if 100. giue but 90. how much ſhal 2.s. $\frac{2}{9}$ giue? Multiplie and diuide and you ſhall fynde 2.s. and ſo much coſt the pound of Muſke in ready money.

Other Rules of Barter, vvherein *is giuen ſome part in ready money.*

WHen a Marchaunt ouer ſelleth hys marchaundiſe & he wyll giue alſo ſome part of hys ouerprice in ready money as the $\frac{1}{2}$ the $\frac{1}{3}$ or the $\frac{1}{4}$ &c. He muſt ſubſtract the ſame parte of money frõ the iuſte price, and alſo from the ouer price of hys marchaundiſe: and the two numbers that remaine after the ſubſtraction is made, ſhalbe that two firſt numbers in the rule of three and the iuſte pryce of the ſeconde marchaunt ſhalbe the third,to know how much he ſhall ouerſell the part of his marchaundiſe.

8. Two Marchaunts wyll chaũge theyre marchaundiſe the one wyth the other, the one of them hath fyne woll at fiue pound the hundred,to ſel for ready money,and in barter he wil ſell it for ſix pounde, and yet hee wyll haue yͤ $\frac{1}{3}$ in ready money. The other hath cloth of 13.s. 4.d. to ſel for ready money. I would know how hee ſhall ſell yͤ ſame in barter? *Aunſwere*: take the $\frac{1}{3}$ of 6.li. which is the ouerprice of the 100.of wolle, & you ſhall haue 2.li. the which abate frõ 5.li. which is the iuſt price of yͤ 100.of wolle & from 6.li. which is the ouerprice,and there ſhal reſt 3.li.and 4.li.for the two firſt nũbers in the rule of three, thẽ take 13.s. 4.d.which is the iuſt price of a yarde of cloth for the thirde number: Then multiply and diuide & you ſhal finde 17.s. 9.d.$\frac{1}{3}$: for ſo muche ſhall the ſeconde ſell his cloth in barter.

9. More, two Marchauntes wyll chaunge their marchaundiſe the one with the other, the one of them hath ware of thre pound 6.s. 8.d. the C. to ſel for readie money, and in barter he will ſell the ſame for 4.li. 3.s. 4.d. & yet he will haue the ¼ in redy money: and the other hath fine Crimſon ſattine of 15.s. the yarde to ſel in barter. I demaund what it is worth in redy money. *Anſwere*, Take the ¼ of 4.li. 3.s. 4.d. and abate it frō 4.li. 3.s. 4.d. and from three pounde 6.s. 8. pence, and there reſteth 3.li. 2.s. 6.d. & 2.li. 5.s. 10.d. for the two firſt numbers in the rule of three, and 15.s. for yͤ thirde number which is the ouerprice of the yarde of ſattine. Then multiply and diuide, and you ſhall fynde 11.s. And ſo much did the yarde of Sattine coſt in ready money.

10. Two Marchaunts will chaūge their marchaundiſe the one wyth the other, yͤ one of them hath tinne of 50. ſhillings the hundred to ſell for ready

money, and in barter he wil ſell it for three pounde 6.s. 8.d. and hee wyll gaine after ten vpõ the hundred, and yet he will haue ẏ one halfe in ready money: and the other hath leade of 3. halfepence the li. to ſel for redy money. I demaund how hee ſhal ſell the pounde in barter? *Anſwere*: See firſt at ten vppon the hundred, what the three pound $\frac{1}{3}$ wil come vnto, and you ſhall finde that they wil come to 3.li. $\frac{2}{3}$, which is 13.s. 4.d. of the which, the halfe whych he demaundeth in ready money, is 36.ſhillings and 8. pence, the whych being abated from fyftye ſhillings, and alſo from three pounds 13.ſhillings 4.pence, there ſhall reſte 13.ſhillings 4. pence, and one pound 16.s. 8.d. for the two firſte numbers in the rule of three, which you muſte put al into halfepence, and thre halfepence for the thirde number, and thẽ multiply and diuide, & you ſhall finde 4.d. $\frac{1}{8}$, and for ſo much ſhall he ſell ẏ pounde of leade in barter.

11. More, twoo marchauntes wyll chaunge their marchaundiſe the one with the other, the one of them hath ſteele of 16.s.8.d.the hundred waight to ſell for ready money, & in barter he will ſell it for 25.s. and yet hee loſeth after ten vpon the hundred, but hee wyll haue the $\frac{1}{2}$ in readye money, the other hath yron of 6.s. 8.d.the hundred to ſell in barter, I demaunde what it did coſte in readye money?

Aunſwere: ſay if a hundred come but to 90. how much ſhall 25.s. come to? Multiplie and diuide, and you ſhall fynde 22.s.6.d. of the which number, take the $\frac{1}{2}$ which is 11.s. 3.d.& ſubſtract it from 22.s.6.d.and from 16.s.8.pẽce and there ſhall reſt 11.s.3.d.and 5.s. 5. pence, for the two fyrſt numbers in yͤ rule of three, and 6.s. 8.d. which is the ouerprice of a hundred of yron for the thyrde number, then multiplie and diuide, and you ſhal finde 3.s. 2.pẽce, $\frac{14}{27}$: & ſo much did the hundred of yron coſt in ready money.

12. More, two marchaunts wyll chaunge their marchaundiſe, the one with the other, the one of them hath ſeyes of 20.s. 10.d. yͤ peece to ſel for ready money, & in barter he wyll ſell the peece for 21.s. & hee wyll haue the $\frac{1}{4}$ in ready money: The other hath capps of 35. ſhillings the doſſen to ſell for ready money: but hee wyll gaine after ten vpon the hundred. I demaunde how he ſhall ſell yͤ ſame caps in barter? *Aunſwere*: ſaye if a hundred bee worth 110. What ſhal 35.s. be worth, which is the iuſt price of the doſſen of cappes? Multiplie and diuide, and you ſhall fynde 38. ſhillings 6. pence. Then take the $\frac{1}{4}$ of 25. which is 6.s. 3.d. and ſubſtract it from 20.s. 10.d. & from 25.s. and there ſhall reſt 14.s. 7.d. and 18.s. 9.d. for the two fyrſte numbers in the rule of three, and 38.s 6.d. which is the iuſt pryce wyth hys gaine of the doſſen of cappes, for the thirde number: then multiplie and diuide, and you ſhall finde 49.s.6.d.

and for ſo much hee ſhall ſell the doſſen of caps in barter.

¶ The 12. Chapter treateth of the exchaunging of money from one place to another.

FIrſt, you muſt note, that at Andwerpe they vſe to make their accomptes by Deniers de gros, that is to ſaye by pence Flemiſhe, whereof 12. doe make 1.s. Flemiſhe, and 20. ſhillings Flemiſhe doe make 1.li. de gros.

1. If I deliuer in Flaunders, 500.li. Flemiſhe, at 19.s.6.de gros that is to ſay at 19.s. 6.d. Flemiſhe, to receaue 20.s. at London, I demaunde how much I ſhal receaue ſterling at London for the ſayde 5.hundred pounde Flemiſhe? *Anſwere,*: Say, if $19\frac{1}{2}$ giue $\frac{20}{1}$, what will $\frac{500}{1}$ giue? Multiplie & diuide, and you ſhal fynde 512.li.16.s. 4.pence $\frac{12}{13}$ of a pennye. And ſo much ſterling ſhal I receaue in London for

my 500.li. Flemiſhe.

2. If I deliuer in Londõ 375.li.ſterling, to receaue in Andwerp 21.s.9.d. de gros, that is to ſay Flemiſhe, for euery pounde ſterling. I demaunde how many poundes Flemiſh I ſhall receaue in Andwerpe, for the ſayde 375.li.ſterling? *Anſwere*, ſay if $\frac{20}{1}$ giue 21.$\frac{3}{4}$: what will $\frac{375}{1}$ giue? Multiplie & diuide, and you ſhall finde 407.li. So many poũds Flemiſh ſhal I receaue for the ſaid 375.li.ſter.in Andwerpe.

3. If I take vp money at Andwerp after 19.s.6.d.flemiſhe to pay for the ſame at London 20.s.ſter. and when the day of paiment is come, I am forced to rechaũge the ſame, and to take vp money againe here in London to repaye the ſame, ſo that for twentye ſhillings, which I take vp here, I muſt repay, 19. ſhillings 9 d. at Andwerpe. I demaunde whether I doe winne or loſe, and how much vpon ỹ 100.li. of money? *Anſwere*, Say, if 19.$\frac{3}{4}$ giue 19.$\frac{1}{2}$, what will $\frac{100}{1}$ giue?

Multiplie and diuide, and you ſhall finde 98. $\frac{58}{79}$, the which beyng abated frō a hundred there wil remaine 1. $\frac{21}{79}$. And ſo much doe I loſe vpon the 100. pounde of money.

4. If I take vp at London 20. ſhill. ſterling to pay at. Andwerpe 21. s. 8. d Flemiſhe, and when the day of payment is come. I am conſtrained to take vp money againe at Andwerpe wherwith to repay the foreſaide ſum: and there I doe receaue 22. ſhillings. Flemiſhe to pay 20. ſhill. at London. Nowe I demaunde whether I doe winne or loſe and howe much vpon the 100. li. of money after the rate? *Anſwere*, ſay if 21. $\frac{2}{3}$ giue $\frac{22}{1}$. What wil $\frac{1000}{1}$ giue? Multiply & diuide, and you ſhall finde 101. $\frac{7}{13}$, frō the which abate 100. and there wyll remaine 1. $\frac{7}{13}$, and ſo much ſhal I gaine vpon the 100. li. of money.

The exchaunge from London into Fraunce, is not lyke as it is into Flaunders but is deliuered by the French crowne, which is worth 50.ſouſe Tournois the pece.

And here muſte you note that in Fraunce they make theyr accompte by Deniers Tournois, wherof 12.maketh one ſouſe Tournois, and 20.ſou. Tournois maketh 1.li. Tournois, which they cal a Liuer, and yͤ Frēche Crowne is currant amonge Marchaunts for 51. ſouſe Tournois, but by exchaunge it is otherwiſe, for thei wyll deliuer but 50. ſou. Tourneys, which is.2.li. 10.ſou. Tournois for a crowne, or at ſuch price as the takers vp of money can agree wyth the deliuerer. As by Example.

5. If I deliuer 340.li. ſter. here in London after 6.s. 4.d. ſterling the crowne, to receaue at Roan, or at Parris 50.ſou. Tournois for euery crowne, I would knowe how many Liures Tournois I ſhall receaue

there for my 340.li.ſter. *Anſwere*: ſay if 6.s.$\frac{1}{3}$ doe giue mee 2.li. $\frac{1}{2}$. Tour. what will $\frac{6800}{1}$ ſhil. giue (which is the 340.li. reduced into ſhillings) multiplye and diuide, and you ſhall fynde 2684. Liures $\frac{4}{19}$ which is worth 4.s. $\frac{4}{19}$ Tournois, and ſo much ſhall I receaue in Roan or Parris for my 340. li. ſterling.

6. If I deliuer in Parris or Roan, or elſewhere in Fraunce 1250. Liures Tournois, at 50. ſou. Tournois the crowne to receaue for euerye ſuche crowne, 6.s. 3.d. ſterling at London, I demaunde how much ſterling money I ſhal receaue at London for my 1250. pound Tournois. *Anſwere*: ſay, if two pounde, $\frac{1}{2}$ doe giue mee 6. ſhil. $\frac{1}{4}$, what will $\frac{1250}{1}$ giue? Multiplye & diuide, and you ſhall fynde 3125. ſhil. ſterling, which maketh 156. pounde, 5. ſhillings ſterling. And ſo manye poundes ſhall I receaue at London, for the ſayde 1250. pounde Tournois,

nois, after 6. ſhillings thꝛee pence foꝛ euery crowne.

¶ The 13. Chapter treateth of the Rule of Alligation.

The Rule of Alligation is ſo named, foꝛ that it teacheth to alligate oꝛ bynde togither diuers percelles of ſundꝛie pꝛices, and to knowe how much you muſt take of euery percell, accoꝛding to the numbers of the Queſtion.

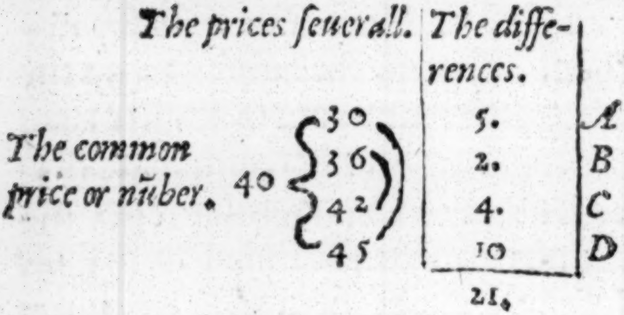
¶ *Example.*

1. A Goldſmith hath thꝛee ſoꝛtes of Golde. The fyꝛſte is woꝛth thirtye Crownes the pounde waight; The ſeconde is woꝛth 36. Crownes. And the thyꝛde is woꝛth 45. crownes, and of theſe thꝛee ſoꝛtes hee wyll make a Scepter of ſyxe pound waight, which ſhall be woꝛth fourtye Crownes the pounde. I demaunde how much hee muſt take of euery ſoꝛte?

Aunſwere: fyrſt you muſt ſet downe the numbers wherof you ſhall make yͤ Alligation (which are 30.36.38.& 45. orderly the one vnder the other, as yf you ſhould make of them an additiõ: and the common number wherunto you will reduce them, ſhall you ſet on the left hand, which common nũber in this exãple is 40. Then marke what ſummes bee leſſer than that commõ number, and which be greater, and with a draught of your pen, euermore lynke two numbers togither, ſo that the one be leſſer thã that commõ number, and the other greater than he. For two greater nor two ſmaller numbers may not be lynked togither, for they wil either be leſſer, or elſe greater than the common nũber: but one greater number, and one ſmaller may bee ſo mixed, yͤ they wyl make the common number. And two greater or two ſmaller nũbers, can neuer make the common number in due order, as hereafter ſhall ap-

appeare.

After that you haue thus lynked them, then macke howe much eche of the leſſer numbers is ſmaller than the common number, and that difference ſhal you ſet againſt the greater numbers, which be linked with thoſe ſmaller, eche of them with his match ſtill on the right hande. And likewiſe you muſt ſet the exceſſe of the greater numbers againſt the leſſer which bee combined with them. Then ſhal you adde all thoſe differences into one ſumme, which ſhalbe the fyrſt number in the rule of thre, and the ſecond number ſhalbe ỷ whole maſſye peece that you wyll haue of all the perticulers, the thirde ſumme ſhall be eche difference by it ſelfe, and by thẽ ſhall you finde out the fourth number, declaring the iuſt portion of euery particuler in that mixture, as nowe by the former exaumple, I wyll make it playne.



21. .6. .5. || 21. .6. .2.

21. .6. .4. || 21. .6. .10.

Here in this former example, you ſee that I haue ſet downe the ſeueral prices, whych bee 30.36.42.45. and haue linked togither 30. with 45. and 36. with 42. The common price 40. I haue ſet on yͤ left ſyde, & the difference of it from euery ſeuerall price, I haue ſette on the righte hande, againſt that ſumme with the which it is lynked. So the difference of 30. frō

fourtye

fourtie is ten, which I ſet againſt 45. that hee is lynked with all, and the difference of 45. about 40 is 5. which I haue ſet againſte 30. So likewyſe, the difference of 42. aboue 40. is 2. that I haue ſet againſt 36. And the differẽce betweene 36. and 40. (which is 4.) I haue ſet againſte 42. Then I adde all thoſe differences togither & they make 21. which I make the fyrſt number in the Rule of thre, and ſyxe the ſeconde number, which is the waight of the Scepter of Golde, and the thyrde number ſhall bee euerye particulers differẽce. Then I worke by the Rule of three: ſaying if twenty and one (which is the differences added togither) do giue mee ſyx pound, which ts the waight of the Scepter, what ſhall fyue giue, which is the fyrſte difference?

Multiplye and diuide, and you ſhall fynde one pounde $\frac{3}{7}$: ſo much muſte I haue of the fyrſte price.

Then

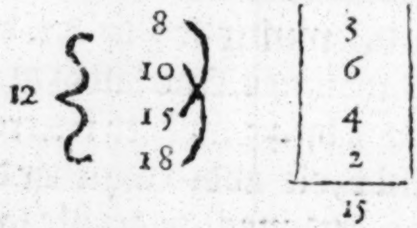
Hec quoqꝫ qꝫ facio Judex mirabitur equus
Scripta que cum venia qualiacunqꝫ leget
Deniqꝫ securus famis liber ire memento
Nec tibi sit lector displicuisse pudor

Then doe likewyſe with the reſt and you ſhall finde $\frac{4}{7}$ of the ſeconde price, one pound, $\frac{1}{7}$ of the thirde price, and 2.li. $\frac{6}{7}$ of the fourth, the which foure ſummes being added togither, doe make 6.li. which is the totall that I would haue. And now to proue if the pryces doe agree, you ſhall doe thus: Fyrſt multiply this totall ſumme 6. by the common price 40. and it wyll make 240.crownes, which you ſhall keepe by it ſelfe. And afterward multiply euery ſeueral ſumme of waight by the price belonging to the ſame waight, and if that ſumme doe agre with the fyrſt that you kept by it ſelf, then is your work well done, as here one pound, $\frac{3}{7}$ is the waight of yͤ ſorte of golde which is of 30.crownes price. Then multiplye 30.by 1.li. $\frac{3}{7}$, & it maketh 42.crownes $\frac{6}{7}$, which you ſhall ſet downe. Then multiplye $\frac{4}{7}$ (which is the wayght of the ſeconde ſorte of gold) by 36. which is yͤ price of yͤ ſame & thereof commeth 20. crownes $\frac{4}{7}$: ſo againe 1. li. $\frac{1}{7}$ multiplied by 42. doth make 48.crownes. And laſt of al 2.li. $\frac{6}{7}$ multiplied by 45.maketh 128.crownes $\frac{4}{7}$. All theſe added togither doth make 240. crownes, agreable to the former ſumme of 40.multiplied by 6 And thus I maye affirme that thys worke is well done.

2. A Tauerner hath foure ſortes of wyne, of foure ſeuerall prices, the fyrſt of eight pence the Gallonde, the ſecond of ten pence the gallonde, the thirde of 15.pence and the fourthe of 18.pẽce. And he wil mingle one punchen with all theſe ſortes, ſo that the Gallonde ſhall bee worth but twelue pence. I demaunde how many Gallondes he muſte take of euery ſorte? *Annſwere*: Firſt ſuppoſe the punchen to holde ſome certaine meaſure, as to conteine 84. gallonds and then the forme wyll be after thys ſort, as you ſee hereafter folowing.

12.

Carmina [illegible]
Nec mare nec venti nec ferat [illegible]
Carminibus metis abest ego proditus ensem
Thesaurum jugulo iam [illegible] jamq; meo



If 15. doe giue 18.

What will. 3. } *They make* { $16\frac{4}{5}$ *of the firſt.*
What will. 6. } *They make* { $33\frac{3}{5}$ *of the ſecōde*
What will. 4. } *They make* { $22\frac{2}{5}$ *of the third.*
What will. 2. } *They make* { $11\frac{1}{5}$ *of the fourth*

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¶ The 14. chapter treateth of the Rule of falſehode, or falſe poſitions.

The rule of falſehode is ſo named, not for that it teacheth any deceit or falſehode, but ŷ by fained numbers taken at al aduẽtures, it teacheth to finde out the true nūber ŷ is demaunded. And this (of all the vulgare Rules which are in practiſe) is the moſt excellent: this rule hath two partes ŷ one is of one falſe poſition alone: ŷ other is of two poſitiōs, as hereafter ſhal appere

Thoſe queſtions which are done by falſe poſitions, haue theyr operations, in a maner like vnto that of the rule of three, but only that in the rule of three, we haue three numbers knowen, and here in thys rule wee haue but one (I meane that commeth in operation) vnto the likenes whereof wee muſte diuiſe two other, the one multiplying, and the other diuiding, as by example.

1. I haue deliuered to a banker a certeine ſumme of poundes in money, to haue of hym by the yeare 6.li. vpon the 100.li. And at the ende of 10. yeares, he paide mee 500.li. for al both principal and gaine. I demaund how much was the principall ſumme that I deliuered at the fyrſt. Here you ſee that there are diuers termes: but the chiefe to worke with all is 500.pound which commeth of the other numbers, that is to ſaye, of 10. and 100. for of them is compounde the tenour

[illegible] vox alta [illegible] rerum
Quaerendi q; mihi nominis ardor erit –
Carmina proveniunt annimo deducto sereno
Nubila sunt subbitis tempora nostra malis

of the queſtion, the practiſe whereof is thus.

Let vs faine a number at pleaſure, and wyth the ſame let vs make oure diſcourſe, euen as though it were the principall ſumme that wée ſéeke for. As by Example. Suppoſe that I deliuered him at yͤ firſt 200.li. the which were worth to me in ten yeres. 120.li. after the rate of 6.li. vpõ the hundred poũde. Thẽ 120.li. added with 200.li. Do make but 320.li. and I muſt haue 500.pound. Thus you ſée that I haue thrée termes for the rule of thrée: the one which ſhall conteine the Queſtiõ the other two, which I haue formed artificially, which are 200. and 320: in ſuch ſort, that 320. ought to haue ſuch proportion to 200, as 500. hath vnto yͤ number that I ſéeke: that is to ſaye, vnto the true principall ſumme, then muſt I haue recourſe vnto the rule of thre, after this ſorte, ſaying.

If 320.li. become of 200.li. of howe much ſhall come 500.li.Multiply 500. by 200.and thei are 100000. the which you ſhall diuide by 320.li. and thereof commeth 312.li.$\frac{1}{2}$ which is ẏ ſumme that I deliuer at the firſt. And thus, this rule hath ſome congruence with the double rule of thzee.

2. I haue a Ceſterne with 3.vnegal cockes conteining 60.pipes of water: And if the greateſt cocke bee opened, the water wyll auoide cleane in one houre , at the ſeconde it wyll auoide in twoo houres , and at the thyrde it will require thzee houres . Nowe I demaũde in what ſpace wil it auoide, all the cocks being ſet open. Suppoſe that it will auoide in halfe an houre, that is to ſay, in 30.minutes . Then muſt there auoide at the fyrſte cocke the $\frac{1}{2}$, which is thirtye pipes , and by the ſeconde cocke the $\frac{1}{4}$ whiche is 15, pipes , and by the thirde cocke the $\frac{1}{6}$, that is tenne pypes , all the whych

Queque volet nata sint ablataqꝫ principis ira
Sedibus in patriis det mihi posse mori.
Ut paruas mandata libris culpabere forsan
Ingeniique minor laude ferenda mihi.

ſummes being added togither dooe make 55. pipes, but it ſhoulde bee 60. pipes. Therefoꝛe I ſay by the rule of thꝛee, if 55. pipes doe voide in 30. minutes: in how many minuts wil 60. pipes voide? Multiplie and diuide, & you ſhall finde 32. minutes $\frac{40}{55}$. And in that ſpace will the water auoide if all the cockes be ſet open.

¶ Of the Rule of twoo falſe poſitions.

A Rule.

The ſũme of this Rule of two falſe poſitions is thus, when any queſtiõ is pꝛoponed appertaining to this rule. Firſt imagine any nũber at your pleaſure, which you ſhal name the firſt poſitiõ, and with the ſame ſhall you woꝛk in ſtede of the true number, as yͤ queſtiõ doth impoꝛt, and if you ſee yͭ you haue miſſed. Then is the laſt number of yͤ woꝛk either to great oꝛ to little, that ſhal you note foꝛ to be yͤ fyꝛſt errour, in the which you haue miſſed with yͤ ſigne of more, or leſſe, which ſignes ſhalbe noted with theſe figures,+:—. This figure +: betokeneth more, & this plaine line — ſignifieth leſſe,that is to ſay the one ſignifieth to much, & the other to little: thē begin againe,& take another number, which ſhall be the ſecond poſition,and worke by the queſtiō as before, if you haue miſſed againe, note the exceſſe or want, for that is the ſeconde errour. Thē ſhall you multiplie the firſt poſition by the ſecond errour croſſewiſe, and againe the ſeconde poſitiō by the firſt errour (& this muſt allwayes be obſerued) & keepe the two products: then if the ſignes be both like, yͭ is to ſay, either both to much, or both to little, abate the leſſer product frō the greater,and likewiſe,you ſhall ſubſtract the leſſer errour frō yͤ greater, & by yͤ remaine of thoſe errours, you ſhall diuide the reſidue of yͤ products:the quotiēt ſhal be the true nūber that you ſeeke for.

But if the two ſignes be vnlyke, yͭ is to ſaye the one to much and the other to lyttle, thē ſhall you adde thoſe productes togither ſo ſhall you alſo adde both the errours togither, and by yͤ ſumme of thoſe errours, diuide the totall ſūme of both the products; the quotient ſhall bee lykewiſe the true number that the queſtiō ſeketh, and thys is the whole rule, as by exaumple.

3. A mā lying at the point of death, ſayde that hee had in a certaine Coffer a hundred Duckets, the whych he bequeathed to three of his frendes by hym named, after this ſort. The firſt muſt haue a certeine portion, the ſeconde muſt haue twiſe ſo many as yͤ fyrſt abating eyght Duckets: and yͤ thyrde muſt haue thre times ſo many as the fyrſt, leſſe by 15. Duckets. Now I demaunde howe many euerye of them muſt haue. *Aunſwere*: Fyrſt I doe imagine that the fyrſt mā had 30.

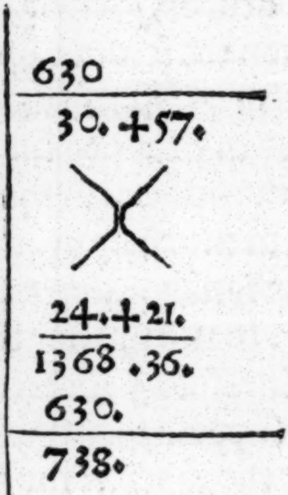
Duckets, then by the order of yͤ queſtion the ſeconde ſhould haue 52: & the third 75. Theſe thre ſumes being added togither do make 157: & I ſhould haue but 100: ſo that this fyrſt errour is to much by 57. then I note a parte the fyrſt poſition 30. wyth his errour 57. to much after this ſort 30. + 57.

Therfore I proſecute my worke and I ſuppoſe that the fyrſte had 24. then by the order of the queſtiõ, the ſecond ſhould haue 40. and yͤ thyrd 57: theſe thræ ſummes being added togither, do make 121. & I muſt haue but 100. ſo the ſeconde errour is to much by 21. Therfore I note 24. + 21. vnder the 30. + 57. as you may ſe in the margẽt of the next ſyde following.

Then I multiplye croſſewayes, 30. (whych is yͤ fyrſt poſition) by twelue whych is the ſeconde errour, and thereof commeth 630. lykewyſe I multiplye twenty & 4. (whych is the ſeconde poſition) by 57. which is the fyrſt errour, and I fynde 1368; then be-

[illegible] ne quis amatus audiat op
Sit mea lenita Carens [illegible] lenis
Nos quoque quisquis erit ne sit mihi ipse precam
Plorator miseris qui volet esse deus

bicauſe the ſignes of the errours are both lyke: that is to ſaye to much, I muſt therfore ſubſtract 630. from 1368. & there will remain 738 which is the diuidende: again I muſt ſubſtract the leſſer errour from yͤ greater, that is to wit, 21. out of 57. and there wil remaine 36. which ſhall bee my diuiſor. Thys done I diuide 738. by 36. and the quotient wyll be $20.\frac{1}{2}$. The which $20.\frac{1}{2}$ is the iuſt number of the Duckets that the firſt mã had for his parte, ſo conſequently the ſeconde man had 33. Duckets, and the thyrde $46.\frac{1}{2}$, as by proofe in the margent, may appere.



$20\frac{1}{2}$
33
$46.\frac{1}{2}$
100.

*1.
73 8.
366.($20.\frac{1}{2}$
3

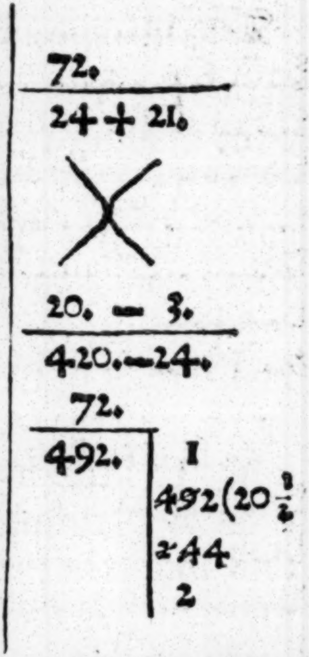
The like number will alſo appere, in caſe the errours were both to litle, as in making the two poſitions by 18. and 20. where you ſhal fynde the two errours both to lyttle, the fyrſt wyll bee to lyttle by 15. and the ſeconde to little by 3. as by peruſing this worke in the margent you ſhal well perceiue.

54.
18.—15.
X
20.—3.
300 . 12.
54.
246. | ~~246~~ (20.$\frac{1}{2}$
~~122.~~
1.

Againe if one of the errours were to muche, and the other to little, yet ſhall I haue the true number, as before: As if the two poſitions were 24. and 20. I ſhall fynde that the firſt errour will be 21. to muche, and the ſeconde wyll be thre to little: Therfore I multiply 24. by 3. croſſewaies, therof commeth 72.

Tu caue defendis quam vix mordebere dictis
Causa ptrocinio non bona major erit —
Jnuenies alliquem qui me suspiret ademtum
Carmina nec siccis perlegat ista genis

Lykewiſe I multiplye twentye by 21. the product will be 420: Theſe two ſummes 72. and 420, I adde both togither bycauſe yͤ ſignes of the errours bee vnlyke, & they make 492. the which ſhall bee my diuidende, and againe, I adde the the leſſer errour 3. wyth the greater errour 21. and they make 24. for my diuiſor, thē diuiding 492 by 24. the quotient wilbe 20$\frac{1}{2}$: as in the margent doth plainly appeare.



And now bicauſe you ſhall not forget thys part of the rule, learne thys briefe remembraunce folowing.

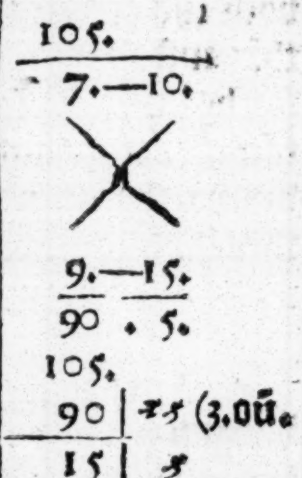
The ſignes both like ſubſtractiō do require.
And vnlike ſignes addition will deſire.

The meaning whereof is thus yf both the errours haue lyke ſygnes, thē muſt the diuidende and the diuiſor be made by ſubſtraction, as is taught before, and if thoſe ſygnes bee vnlike, then muſte I by addition gather the diuidende, and the diuiſor, as I haue done in this laſte example.

4. A man hath twoo ſiluer cups of vnegall waight, hauinge to them bothe, but one couer, the weyght whereof is 5. ounces, if the couer bee put to the leſſer cuppe, it wyll bee in double proportion vnto the waight of the greater, and the couer being put to the greater cuppe, wyll bee in triple proportion, vnto the waight of the leſſer. I demaunde what was the waight of euerye cuppe?

Suppoſe that the leſſer cuppe dyd wayghe ſeauen ounces, then wyth the couer it muſt waigh twelue, and thys waight ſhould be in double proportion vnto the greater, therefore the

quaerenti plura legendum
Ne quae non opus est forte loquare cave
Protinus admonitus repetet mea crimina lector
Ut peragar populi publi quo ore reus



the greater muſte waygh ſixe ounces adde vnto it 5. ounces for yͤ couer, all will be 11. ounces, but it ſhoulde be 21. for to haue it in triple proportion, vnto 7. which repreſenteth the waight of the leſſer cuppe: So that this fyrſte errour is to little by 10. which you ſhal note after 7. in this ſorte 7.—10.

After you ſhall ſuppoſe ſome other number, as 9. & make the lyke worke as before, ſo ſhal you find 15. to little, for yͤ ſeconde errour, which you ſhall put behinde 9. and then worke with the reſte as aboue is ſayde, and you ſhall fynde that the leſſer cup wayed three ounces, and conſequentlye the greater foure ounces.

5. One man demaunded of another

ther in a morning what a clocke it was, the other made hym this aunſwere, if you doe adde (ſaith hee) the $\frac{1}{4}$ of the houres which be paſte ſynce midnight, with the $\frac{2}{3}$ of the houres which are to come vntyll noone, you ſhall haue the iuſte houre, that is to ſay, you ſhall knowe what a clocke it was: Suppoſe ỹ it was 4. a clocke in ỹ morning, ſo ſhoulde there remaine 8. vntill none: then I take the $\frac{1}{4}$ of 4. which is 1. and the $\frac{2}{3}$ of eight which is 5. $\frac{1}{3}$, and I adde them togither, ſo I finde 6. $\frac{1}{3}$ and ſuppoſed but 4. therefore this fyrſt error is to much by 2. $\frac{1}{3}$, which I note after my poſition thus, 4. + 2. $\frac{1}{3}$: then againe I ſuppoſe anothee nũber, ỹ is to ſaye 9. ſo ſhoulde remaine but 3. houres vntill none, I take the $\frac{1}{4}$ of 9. and the $\frac{2}{3}$ of 3. which is 2. $\frac{1}{4}$ & 2. theſe I adde togither and they make 4. $\frac{1}{4}$: but I ſuppoſed ỹ it was 9. therefore the ſeconde errour is 4. $\frac{3}{4}$ to little which I note behinde my poſition thus 9. + 4. $\frac{3}{4}$.

And

Siquis ut insto stulto nostri non deminor illo
Siquis ut qui qui Dei regem sentit requirit dies
Yerius eius Dires salutem lamen esse negabis
Si quoque quae quaeD uirtam uiuus habere Dei

And then I multiplie croſſewyſe, as before is taught, and bicauſe the ſygnes of the errours are vnlike, that is to ſaye, the one to much, and the other to lyttle, therefore in thys worke I muſte adde the productes, and they wyll bee 40.

$$\frac{19.}{4.\ +\ 2.\frac{1}{3}}$$

$$\times$$

$$\underline{9.}\ -\ \underline{4.\frac{3}{4}}$$

$$21.\qquad 7.\frac{1}{12}$$

$$\frac{19.}{40.}$$

Lykewyſe I adde the errours, and they be $7.\frac{1}{12}$. Then I diuide 40. by $7.\frac{1}{12}$, and thereof commeth 5. houres $\frac{11}{17}$, and that houre it was in the mornyng.

¶ The 15. Chapter treateth of ſportes, and paſtime, done by number.

IF you would know the number that anye man doth thinke or imagine in hys minde, as though you coulde deuine.

Bydde him triple the ſame number, then of the product let him take the $\frac{1}{2}$

if the number bee euen, or elſe the greater halfe, if yͤ ſame be odde, then bid hym triple againe the ſaide $\frac{1}{2}$: after ſay to him that put away, if he cã 36. 27. 18. or 9. from the laſt number being tripled: yͭ is to ſaye, cauſe hym ſubtellye to put awaye 9. as many times as is poſſible & keepe the nũber ſecretly: & when he can no more take away 9. thẽ to know if yͭ yet there remaine any nũber, bid him abate 3. 2. or one, if he can: this done, ſee howe many times 9. you haue cauſed hym to abate, for the which keepe you in minde ſo many times 2. & if that you know yͭ he had any thing remaining beſyde the nines, the ſame ſhall alſo note vnto you 1.

Suppoſe that he thought 6. which being tripled is 18. wherof the $\frac{1}{2}$ is 9. the triple of yͭ is 27: nowe cauſe him to abate 18, or 9. or 27. and againe 9: but then he will ſay vnto you that he cannot, bid him then abate 3. or 2. or 1. he will ſay alſo that he can not: wherfore

Neue liturarum pudiat qui viderit illas
De lacrimas factas sentiat esse meis
Vade liber verbisqꝫ meâ locâ gratia soluta
Contingam cẽrte quo licẽt illa pede

fore conſidering that you haue made him to abate thrœ times 9. iuſtly, you ſhal tell him that he thought 6. for 3. times 2. maketh 6. If he had thought 5. the triple thereof is 15. whereof the greater $\frac{1}{2}$ is 8. the triple of ẏ maketh 24. which cōteineth two times 9. thei are worth 4. & the remaine ſignifieth 1. the which added togither make 5. which is ẏ number that he thought.

2. If in any company, one of them hath a ringe vpō his finger, and you would know by maner of deuining, who hath the ſame & vpon what finger & what ioint: cauſe the perſons to ſit down in order, & kepe likewiſe an order of their fingers: then ſeperate your ſelf from them in ſome certeine place, and ſay vnto one of the lookers on, that he double the number (marking the order) of him ẏ hath ẏ ring: and vnto the double bid hym adde 5. and then cauſe him to multiplye this addition by 5. & vnto the product byd him adde the number of the finger of

the perſon which hath the ring: be it y͏ᵗ the ſame laſte ſum did amoūt to 89. then afterwarde ſaye to him y͏ᵗ he put after the ſame laſt nūber toward hys right hande a figure ſignifiyng vpon which of the ioints he hath the ring. As if it bee vpon the thirde ioint, let him put 3. after 89. and it wil be 893: this done, you ſhall aſke him what number hee kepeth, from the which you ſhall abate 250. & you ſhall haue thrꝛee fygures remaining at the leaſt. The fyꝛſte towarde your lefte hande ſhall ſignifye the number of the perſon which hath the ring. The ſecond oꝛ middle fygure ſhall repꝛeſent the number of the finger. And the laſt fygure towarde your right hande, ſhal betoken the number of the ioint. As if the number which hee did keepe were 893. from that you ſhall abate 250. and there wyll remaine 643: Which do note vnto you, that y͏ͤ fyrſt perſon hath the ring vpon the fourth finger, and vpon his thirde iointe.

But

Nec te purpureo velent vaccinia fuco
Non est conveniens luctibus ille color
Nec fragile gemine poliantur pumice frontes
Hirsutus passis ut videare comis. &c.

But note yͭ when you haue made your ſubſtraction, if there do remain a cipher in the place of tennes, yͭ is to ſay in yͤ ſeconde place, you muſt then abate from that figure which is in yͤ place of hundꝛeds, yͭ is to ſay from the figure which is next your left hand, & yͭ ſhalbe woꝛth ten tenths, ſignifiyng the tenth finger: as if there ſhould remaine 703. you muſt ſay that the ſyxt perſon (vpon his tenth finger & vpon hys thirde ioint) hath the ring.

3. And after the ſame maner, if a mā do caſt thꝛæ dice, you may know the poinctes of euery one of thē, foꝛ if you do cauſe him to double yͤ poincts of one die, & vnto yͤ double to adde 5. & the ſame ſum to multiply by 5. & vnto yͤ pꝛoduct adde the poincts of one of yͤ other dice, and behinde the number toward yͤ right hand, to put yͤ figure which ſignifieth yͤ poincts of the laſt die, & thē ſhal you aſke him what nūber he kepeth frō yͤ which abate 250. & there wil remaine 3. figures, which do

note vnto you yͤ poincts of euery dye.

4. Likewiſe if 3. of your companions, to ſay, Peter, James, and John that woulde (in your abſence) giue themſelf euery one a contrary name: as for example: Peter would be called a king, James a duke, and John a coũtie; And I would deuine which of them is called a king, which the duke, and which the countie. Take 24. ſtones, or other peeces whatſoeuer, & giue vnto Peter 1. vnto James 2. and vnto John 3. or otherwiſe. But marke well vnto which of them you haue giuen 1, vnto which 2, and vnto whom 3. Then leauing the 18. ſtones (before thẽ) that are remaining, you ſhall abſent your ſelfe from theire ſyght, or elſe tourne your face from them, ſaying thus vnto them, whoſoeuer nameth hymſelfe a king: for euery ſtone that I gaue him let hym take one of the reſidue, and hee that nameth himſelfe a duke for euerye ſtone that I gaue him let him take 2

Parve nec invideo sine me liber ibis in urbe
Hei mihi quod domino non licet ire tuo
Vade sed incultus qualem decet exulis esse
infelix habitum temporis huius habe

of them that remain, and he that calleth himſelf a countie, for euery ſtone that I gaue him let him take 4: this being done approche nere them, and marke how many ſtones are remaining: and know this, that there can not remaine any other number, but one of theſe ſixe, 1, 2, 3, 5, 6, 7, for the which ſixe numbers we haue choſen to euery of them a ſeuerall name, which are theſe: *Angeli, Beati, Qualiter, Meſsias, Iſrael, Pietas*: eche of them containing three Vowelles, a, e, i, which doe ſhew the names by order: That is to ſay, A, ſheweth which is the kinge, E, telleth which is the duke and, I, ſheweth which is yͤ county: in followinge the order how, & to whom you haue giuen one ſtone, to which 2, and to which 3.

1	2	1	2	3	3
2	1	3	3	1	2
3	3	2	1	2	1
a	e	a	e	i	i
e	a	i	i	a	e
i	i	e	a	e	a
1	2	3	5	6	7
A	*B*	*Q*	*M*	*I*	*P*

Then if there doe remaine but one ſtone, the firſt name *Angeli,* (by theſe thre vowels a, e, i,) ſheweth that Peter is the king, James the duke, and John the countie. And if there doe remaine 2 ſtones, the ſeconde name *Beati,* ſhal ſhew you by theſe three vowels, e, a, i, that Peter is yͤ Duke, James the King, and John the countie. And ſo of the other as by this Table doth plainely appere.

⁂

FINIS.

Here beginneth the Table of this Booke.

¶ *The contentes of the Chapters of the firſt parte.*

The diffinition of nūber. fol.1.
Numeration in whole nūber fol.eodem. Cap.1.
Addition in whole number. Cap.2. fol.6.
Subſtraction. ca.3. fol.9.
Multiplication. ca.4. fol.12.
Diuiſion. ca.5. fol.21.
Progreſſion Arithmetical and Geometricall. ca.6. fol.32.
The Rule of three called the Golden rule. And the backer rule, vnto all theſe is added their proofes. ca.7. fo.34.

The Contentes of the ſeconde part.

¶ The firſt Chapter ſheweth what a fraction or broken number is. fol.43.
Reduction of fractions. ca.2. fo.44.
Abbreuiation. ca.3. fol.50.

Addition in fractions. ca.4. fol.54.
Subſtraction. ca.5. fol.58.
Multiplication in fract. ca.6. fol.61.
Diuiſiō in broken numb. ca.7. fo.64.
Duplacion, Triplacion, and Quadruplacion. ca.8. fo.68.
All yͤ proofes of fractions. ca.9. fol.69.
Queſtions done by Reductiō, by Addition, Subſtraction, Multiplication, and by Diuiſion in broken numbers chapter.10. fol.71.

The Contentes of the thirde part.

Rules of Practiſe called briefe rules. chap.1. fol.79.
Rules of three compounde, being 4. in number. ca.2. fol.99.
Queſtions of the trade of Marchandiſe. ca.3. fol.101.
Queſtions of loſſe and gaine in the trade of marchandiſe. ca.4. fo.108.
Queſtions of diuers breadthes and lengthes of tapiſtries. ca.5. fol.113.
Queſtiōs of the reducing of paumes of Genes into yardes. ca.6. fo.115.
Queſtions of marchaundiſe ſolde by waight,

waight, wyth brief rules for ẏ ſame. chapter.7. fol.116.

Queſtions of Tares and allowaunces. ca.8. fol.119.

[illegible]ſtions done by the double rule of [illegible] ca.9. fo.[illegible]22.

Queſtions [illegible] Rule of felo[illegible]ip. chap.10. fol.124.

Queſtions of bartering. ca.11. fol.138.

Queſtions of the exchaunges. chapter.12. [illegible]l.146.

Queſtions of the Rule of Alligation. chapter.13. fo.146.

Queſtions of the Rule of falſehode. chapter.14. fol.152.

Queſtions of ſport and paſtime, done by number.

Tim: Wrighte

Booke

£	s	d
3	2	4
2	5	6
4	4	3

Finis.

F

Finis